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The Hon. J. D. Hazen, Minister of Marine and Fisheries.

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Canada. Marine and Fisheries, Dept. of

Canada.

Her natural Resources, Navigation, Principal Steamer Lines and Trans-continental Railways.

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THE 12th CONGRESS OF THE PERMANENT INTERNATIONAL ASSOCIATION of NAVIGATION CONGRESSES

ISSUED BY THE DEPARTMENT OF MARINE AND FISHERIES.

HON. J. D. HAZEN, Minister; ALEXANDER JOHNSTON, Esq., Deputy Minister.

CONTENTS

	Page.
Report of Deputy Minister of Marine and Fisheries to the Minister	5
Introduction	7
Summary of Organization of the Permanent International Association of Navigation Congresses	9
Information relating to Canada	19
Inland Navigation: St. Lawrence river ship channel: Illustrations of plant	20
Canals, length and features of. Illustrated	27
Summary of survey of Georgian Bay canal	53
Great Lakes, length, breadth, area and elevation	56
Navigable lakes of Northern Ontario	63
" " Manitoba	65
" " Saskatchewan	66
" " Alberta	67
" Rivers of Western Ontario, Manitoba, Saskatchewan, Alberta and Mackenzie territory	67
Inland navigation in British Columbia. Illustrated	71
Principal harbours in Ontario. Illustrated	74
Rivers in the Province of Quebec	83
" " " New Brunswick	84
List of principal rivers in Canada and length	88
Maritime navigation: St. Lawrence river and gulf, Atlantic coast, Bay of Fundy, Straits of Canso and Northumberland	89
Tides and currents of eastern waters	116
Maritime waters of British Columbia	117
Tides of the Pacific coast	125
Radio-telegraph map	139
Aids to navigation in Canada. Illustrated	127
Area and resources of Canada. Illustrated	147
RAILWAYS OF CANADA:	
Grand Trunk. Illustrated	167
" Rates	181
Grand Trunk Pacific, Transcontinental Railway: description of. Illustrated	181
Canadian Pacific Railway, Transcontinental: description of. Illustrated	187
Canadian Pacific Railway rates	213
Canadian Northern Railway, Transcontinental: description of. Illustrated	214
Intercolonial Railway: description of. Illustrated	227
Location of steam railways in Canada	236
Steamboat lines running eastward from head of Great Lakes, including St. Lawrence river and Maritime Provinces and rates. Illustrated	242
Ocean-going steamship lines running between Canadian Atlantic coast and European ports, and rates. Illustrated	267
Lines of steamboats plying on different waters of Eastern Canada. Illustrated	270
Lines of steamboats operating on Pacific coast and inland waters of British Columbia. Illustrated	272
Ontario Agricultural College, Guelph. Illustrated	273
Macdonald College, St. Anne de Bellevue, P.Q. Illustrated	276
Principal hotels in Canada and rates	278

NOTE.—The Department of Marine and Fisheries will not be held responsible for any error in rates published herein.

The diagrams relating to canal locks referred to on page 27 were omitted. The One Hundred Mile map referred to on page 144 is at the end of the book.

REPORT OF THE DEPUTY MINISTER TO MINISTER OF MARINE AND FISHERIES.

Hon. J. D. HAZEN,
Minister of Marine and Fisheries.

Sir,—I have the honour to report that this book was prepared in accordance with instructions, given in the month of March last, in view of the meeting of the Twelfth Congress of the Permanent International Association of Navigation Congresses at Philadelphia, U.S.A., on the 23rd of May of this year, which Canadian delegates will attend.

It contains information, published for the first time, of navigable distances of lakes and rivers in northwestern Ontario, Manitoba, Saskatchewan, Alberta and Mackenzie territory; the draught and number of steamers plying on those waters. Similar information is given of the inland waters of British Columbia for the first time.

In the description of the Transcontinental and Intercolonial railways much new information appears in published form. Original photographs of various localities were procured from the headquarters of the railways and steamboat lines.

The book is copiously illustrated to convey information by that means as well as by the text.

The book has been published for distribution in Canada and other countries.

The compilation was done, arranged and edited by Mr. W. W. Stumbles, an officer of this Department, aided by his staff.

A. JOHNSTON,
Deputy Minister of Marine and Fisheries.

Ottawa,
May 10, 1912.

INTRODUCTION

THIS book is intended as a sketch of Canada, for the use of the Representatives, Delegates and Members of the XIIth Congress of the Permanent International Association of Navigation Congresses, to be held at Philadelphia, also, to give a succinct account of the nature, purposes and methods, of the Association, for the general public.

The information pertaining to the Association has been compiled from the correspondence in the Department of Marine and Fisheries with the Executive Committee of the Association permanently located at Berlin, the published regulations of the Association, and from published circulars issued by the Local Organizing Commission of the XIIth Congress, to be held at Philadelphia.

In 1903, the Belgian Government requested the Government of Canada to unite with the governments of other States, in support of the International Association of Navigation Congresses. The matter was considered by the Canadian Government and the Minister of Marine and Fisheries was selected in 1905, as the Canadian representative. The annual contributions, entitling Canada to representation and the privileges of the Association and Congresses, have been paid by the Department of Marine and Fisheries.

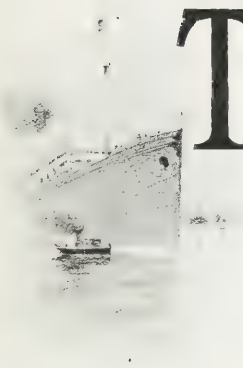
This book has, therefore, been compiled under instructions from the present Minister of Marine and Fisheries and his Deputy, by an officer of the Department.

The condensed description of Canada, her numerous waterways and extent of navigation improvements, have been taken from sources of information within the Canadian Government Departments. The descriptions of railways, canals and steamboat lines, have been compiled from information furnished by the managements controlling them, excepting in the cases of minor lines. The minor lines of steamboats are very numerous in Canada; they afford comfortable accommodation for local traffic, on lakes and rivers, to well known resorts and even for tourists, who may choose to visit the innumerable picturesque spots out of the line of ordinary traffic. Some information respecting a few of them, obtained in a general way, is included in the book.

As a matter of first rate importance to representatives and delegates to the Congress held in Philadelphia, are reliable particulars of means of communication at the points where they will leave the United States to enter Canada and proceed by water or railway over the lines which they may make their choice. The book contains information relating to Canada, important lines of communication on this continent, and ocean going steamers, that will be valuable to travellers engaged in business, or tourists who seek health in our well known temperate and bracing climate, or to those who enjoy the varied and extraordinary scenery that is presented to the eye of the observer everywhere in Canada; also to the keen sportsman, yachtsman, canoeist, surf bather and others, who may find the means of satisfying any reasonable desire connected with travel, pastime or recreation.

The publishing of the work has been done by the Government Printing Bureau in Ottawa, and credit is due the printers for the prompt publication in the limited time at their disposal.

THE PERMANENT INTERNATIONAL ASSOCIATION OF NAVIGATION CONGRESSES.



THE main questions that will naturally be asked by persons unacquainted with the Association and its proceedings, are its aims and methods; the professional, expert, and scientific attainments of its members and the beneficial results emanating from its action or deliberations. The scope of the subjects dealt with by the Association might reasonably form an inquiry. The Association is not well known in Canada, and this is due to the fact that its meetings have been held on the continent of Europe and Great Britain, and no reports have appeared in the press of Canada, nor have individuals and bodies, as yet, outside the Government, become interested in the proceedings of the Association.

An historical survey of the Association and its origin would be very instructive, particularly on account of the papers read and discussions held on practical subjects bearing on improvements to navigation, transportation, mechanical appliances and subjects specially interesting to maritime countries. But no adequate idea of this side of the Association's existence and proceedings, can be given in this pamphlet.

Organization.

The Association was organized in 1885, in Brussels. Corporations and private individuals at first formed its membership, and it was apparent at the outset that there was a field of usefulness open to it. Arrangements were made to hold congresses in different cities in Europe, and invitations were sent to different countries and corporations of the world, to send representatives and delegates to the congresses. The Association continued under its original organization, assembling its members at intervals, in Vienna in 1886, Frankfort-on-Main in 1888, Paris in 1889, at Manchester in 1890, in London, 1891, at Paris again in 1892, at the Hague in 1894, and at Brussels again in 1898.

At the congress at Paris in 1900, the question of forming a permanent international association was taken up and a joint committee formed to submit a plan of organization, at the next congress. The plan was adopted and the present Permanent International Association of Navigation Congresses, was formed at Dusseldorf in 1902.

Since 1902, two other congresses have been held; one at Milan in 1905 and one at St. Petersburg in 1908.

As already stated, shipping corporations, shipowners and private individuals led the way in establishing the Association. A steady growth has been maintained by the addition of Government bureaus and departments, city corporations, chambers of commerce, boards of trade, river and canal commissions, harbour boards, societies of engineers, army engineers, manufacturers, contractors, shippers, marine associations, technical schools, libraries and other institutions interested in navigation and the reports of the Association.

Thirty-eight Governments, the Danube Commission and the Suez Canal Company are now annual contributors respectively of from 200 to 8000 francs, 371 corporations contributing from 10 to 100 francs each and 1,681 private members, making a total membership of 2,052.

In the numerical list of membership, Germany holds first place, and is represented by 149 corporations and 304 permanent members; France, by 57 corporations and 191 permanent members; Belgium, by 14 corporations and 216 permanent members; United States, by 16 corporations and 301 permanent members; Italy, by 43 corporations and 133 permanent members; Austria, by 21 corporations and 102 permanent members; Great Britain, by 5 corporations and 44 permanent members; Denmark, by 15 corporations and 36 permanent members; Switzerland, by 19 corporations and 16 permanent members; Russia, by 1 corporation and 57 permanent members; Spain by 6 corporations and 24 permanent members; Sweden, by 4 corporations and 34 permanent members; the Netherlands, by 4 corporations and 71 permanent members; Argentine Republic, by 2 corporations and 62 permanent members.

The other 24 countries and states are represented only by their Governments, a few corporations and a comparatively small number of permanent members.

In 1903, the Belgian Government requested the Government of Canada to consider the question of giving pecuniary support to the Association and thereby give Canada representation at the congresses, and the right to send delegates. In 1905, Canada signified her intention tos upport the Association by an annual subscription of 1000 francs, which entitled the Government to one representative and four delegates.

In 1908, several countries on the continent of America responded to a similar request and allied themselves with European and other countries of the world, in support of the congresses.

MEMBERSHIP.

This summary of the composition of the Association shows the important position which it has attained. Membership may be easily secured by corporations and individuals who are in sympathy with its aims, by the payment of a few francs. The regulations provide that Governments and corporations, which grant an annual subsidy, may appoint delegates, one delegate for every 250 francs of the annual subsidy paid by Governments, and one delegate, on the payment of 100 francs, by corporations. Private membership may be either permanent or temporary, and the fee is 25 francs. Permanent members are entitled to attend and vote at every congress. They may become life members by a single payment of 125 francs. Temporary members are allowed to attend the congress for which they have been enrolled. Honorary members pay no subscriptions.

CONSTITUTIONAL ARRANGEMENT.

The constitutional arrangement of the Association provides for a Permanent International Commission having its headquarters in Brussels. From amongst the members of this Commission, a Permanent Council and an Executive Committee are selected.

It rests with each country having representatives on the Commission or Permanent Council to fill vacancies when they occur.

The Permanent International Commission is composed of members belonging to the various countries represented in the Association. Each country is entitled to one representative on this Commission for each 1000 francs of its total annual contribution. The number of representatives cannot exceed ten.

The Permanent Council is composed of representatives chosen from the Permanent Commission, one for each country contributing annually 5,000 francs and two for each country contributing a greater amount than this figure. The Permanent Council carries out the resolutions of the International Commission and decides all questions not expressly reserved for the decision of the Commission, and assists and controls the Executive Committee. It forms a part of each congress General Presiding Committee, acts in conjunction with the Local Committeee of Organization. The Council meets whenever summoned by the Executive Committee, or upon the request of a quarter of the members of the Council.

A Local Organizing Commission is formed to make preparations for each congress and holds office till the close of the congress.

It draws up, after consultation with the Permanent Council, the detailed programme of the meetings; it organizes the various excursions,

The Driveway along Rideau Canal, Ottawa.

A View of the Driveway, Ottawa.

Scene on the Driveway, Ottawa.

The Observatory, Experimental Farm, Ottawa.

receptions and functions; it provides the rooms in which the meetings are held and organizes the correspondence service, the accommodations, interpreters and translators.

This Commission defrays the expenses of the congress from a fund derived from subscriptions from temporary members, who pay 25 francs ($5), from special government grants and a subsidy from the Association.

Objects and Aims.

The object of the Association is to promote the progress of inland and maritime navigation. The members give their attention more directly to construction of works, improvements of the waterways, plans, canals, locks, dry docks, floating docks, dredging, surveys, protection of river banks, utilization of shallow rivers, vessels and means of propulsion, means for docking and repairing, mechanical equipment of ports, including wharf accommodation and facilities for loading and unloading vessels, transportation generally and transfer of articles from vessels to railways. The economic and technical study of these subjects, is given a large share of attention, as well as the safety of navigation and improved aids to navigation.

Durability, strength and cost of material entering into permanent construction of works are among the subjects discussed and determined. The future projects of governments, harbour boards, corporations and canal commissions, pertaining to navigation, are studied and a definite knowledge of the works under construction, in the most important harbours of the world, all come under the category of subjects dealt with by the Association. All the subjects are classified, and papers submitted to the eminent men and experts who have made these subjects a life study.

Personnel of the Permanent International Commission.

The members comprising this Commission consist of heads of Government departments and bureaus, envoys, civil and hydraulic engineers, army engineers, government inspectors-general, consuls, meteorologists, hydrographers, admirals, naval officers, marine officers, railroad and canal superintendents, directors of routes of inland navigation, chief inspectors of railroads, consulting members of canal commissions, persidents of chambers of commerce, heads of departments of public works, university professors of technique and superintendents of ways and communications.

The high officers of state, the prominent positions in the professions and corporations, attained by the representatives of different countries, are of themselves sufficient evidence of the ability, attainments, and qualifications of the personnel of the different branches of the Association. In the Commission and Permanent Council are eminent and distinguished men who have identified their names with some great works of construction, both national and international.

The Permanent Council is chosen from among the members of the Permanent Commission, one for each country contributing annually 5,000 francs, and two for each country paying more than that sum.

Papers and Methods at Session of Congress.

(Copied from Regulations.)

" 1. The Congress comprises:

Two sections, one for inland navigation, and the other for maritime navigation. These sections may be subdivided.

2. Its proceedings consist of general meetings, meetings of the sections, and excursions.

The number of questions to be submitted to the deliberations of a Congress should be limited, so far as possible, to three for the inland navigation section and to three for the ocean navigation section. The same rule applies to the communications.

As a general rule each country will furnish but one paper on any given question or communication.

The reporter, or reporters, selected by the Comission for a question or communication and for a given country, will collect in that country all the elements needed for the preparation of their paper.

The Permanent Commission appoints a general reporter for each question, to whom is entrusted the duty of presenting a short review to the Congress on the several points of the question, and also an analysis of the papers transmitted to him.

The General Reporter may give his own views, and personal information, and arrange with the different writers of papers for formulating joint proposals.

The manuscripts shall be transmitted to the Secretary General in English, French or German, copied on one side only of the paper and, as far as possible, by the typewriting machine.

The "communications" are not submitted for discussion until after the programme of the "questions" has been concluded, and then only provided that time permits.

These communications are classified as follows:

Those which, on account of their general interest, are printed at the expense of the Association, and those which are printed at the expense of their authors; in this latter case the requisite number of copies has to be furnished to the Executive Committee.

They are not voted upon, nor are they brought up for consideration at a general meeting.

Writers of papers upon "questions" or of "communications" may, if they wish, furnish translations themselves of their papers in the several languages of the Congress.

The "questions " are first discussed in the meetings of sections, and afterwards at a general meeting.

The deliberations, either at a general meeting or at meetings of sections, are conducted in the three languages of the Congress, and also, when required, in the language of the country where the Congress is held.

2. Unless otherwise decided by the meeting, persons taking part in the discussions, are not allowed to speak for more than fifteen minutes, nor can they address the same meeting more than twice upon the same subject.

Members of the Congress who have spoken at a meeting must, within twenty-four hours, deliver to the Sectional Committee a resumé of their remarks, to enable a report of the proceedings to be drawn up.

The Committee shall have the right to request the author to abridge his resumé; and should it not have been revised and amended in due time, the Committee will undertake the abridgement.

The résumé of the discussions, arranged and edited by the committees of the sections, together with the several conclusions adopted by the majority of the members voting, are transmitted by the General Reporter to the Permanent Council the day before the last general meeting; they are then laid before the latter where they are discussed and voted upon.

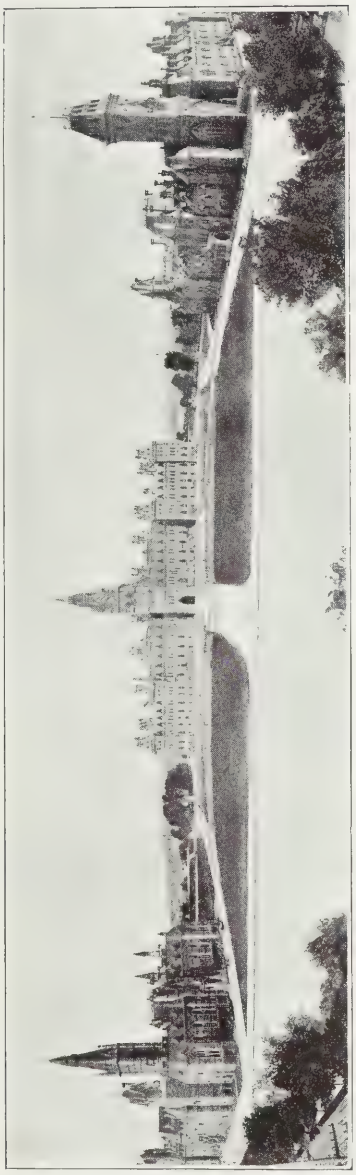
A detailed report of the proceedings of each section of the Congress is prepared and furnished within three months after the date of the closing of the Congress, to the Executive Committee by the Committee of the Congress, assisted by the Vice-Presidents and Secretaries of the offices of the sections.

As regards the general meetings and excursions, a similar report is prepared, within the time stated, by the General Secretary of the Session.

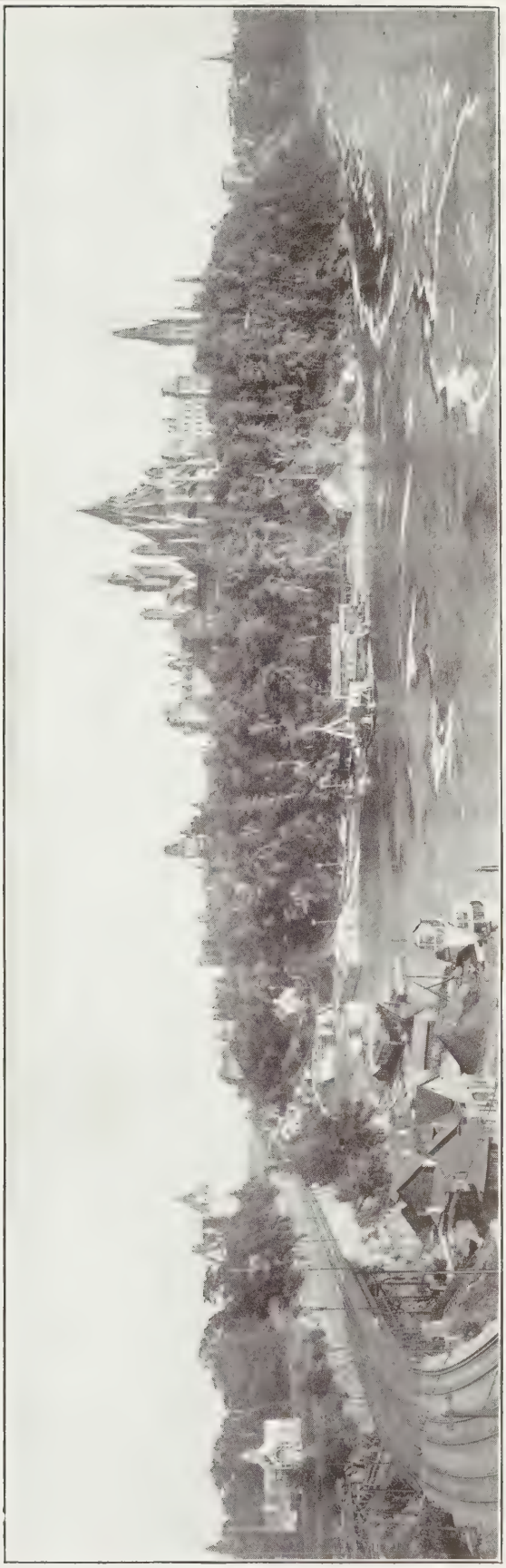
The joint record so compiled is published in the three languages under the direction of the Executive Committee."

At the meeting of the Permanent Internanal Commission of the Association held in Brussels in July, 1910, the United States Government representative cordially invited the Association as a body to hold the Twelfth Congress in Philadelphia, Pa., in 1912. The resolution embodying the invitation was cordially seconded by the Government representative of Canada. The two Governments had in view the benefits that would arise from a Congress in America to the two countries and also to members of the Association. The invitation was unanimously accepted, and as a result, the preliminary arrangements were entered upon by the Government of the Republic.

In accordance with the custom followed by the National Governments of countries in which International Navigation Congresses have been held the United States Government conveyed invitations to Great Britain and her Colonies to take part in the meetings of the Congress to be held in Philadelphia. Canada officially accepted the invitation of the United States through the



A View of the Parliament Buildings, Ottawa.



Major Hill Park, Rideau Locks and Parliament Hill, from Nepean Point, Ottawa.

Opening of Parliament.

Opening of Parliament.

British Government and signified her intention of taking part in the Congress.

SUBJECTS TO BE DISCUSSED.

INLAND NAVIGATION.

A. *Questions.*

1. Improvement of rivers by regulation and dredging and, if needs be, by reservoirs. Determination of the case in which it is preferable to resort to such works rather than to canalization or the construction of a lateral canal.

2. Dimensions to be assigned, in any given country, to canals of heavy traffic. Principles of operating. Dimensions and equipment of the locks.

3. Intermediate and terminal ports. Best methods for combining, facilitating and harmonizing the transfer of freight between the waterway and the railway.

B. *Communications.*

1. Applications of reinforced concrete to hydraulic works.

2. Report of the works undertaken and the measures adopted or proposed for the improvement and development of lines of inland navigation, as well as for the protection of the banks of navigable highways.

3. Utilization of the navigation of large but shallow rivers. Vessels and motors.

OCEAN NAVIGATION.

A. *Questions.*

1. Means for docking and repairing vessels.

2. Dimensions to be given to maritime canals. (Technical point of view.) Probable dimensions of the sea-going vessels of the future.

3. Mechanical equipment of ports.

B. *Communications.*

1. High-powered dredges and means for removing rock under water.

2. Report of the most recent works constructed at the more important seaports, especially on those relating to breakwaters. Applications of reinforced concrete; means for insuring its preservation.

3. Bridges and ferry bridges; tunnels under waterways used for ocean navigation. Economic and technical study.

4. Safety of navigation. Lighted buoys.

The papers that will be presented on each of the subjects will be written by some of the most eminent authorities on the subjects in the world, and the discussion at the Congress should be most interesting and valuable.

ARRANGEMENT OF THE UNITED STATES.

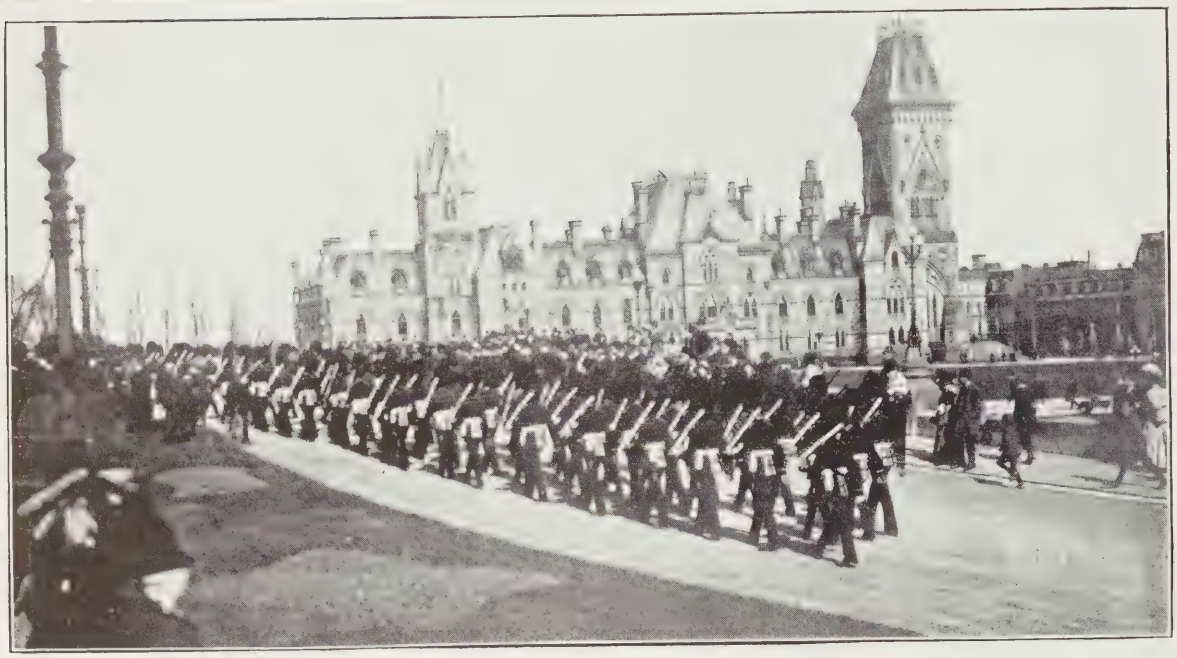
LOCAL ORGANIZATION COMMITTEE.

The Congress will be held under the distinguished patronage of the President of the United States, and will be opened by him.

The Federal Government of the United States has appropriated $50,000, the State Government of Pennsylvania, $25,000, and the City of Philadelphia, as the place at which the Congress will meet, the sum of $25,000, for the entertainment of the members of the Association, to convey them to places of interest or to points where important public works have been constructed and to various ports.

CANADA'S CONNECTION.

The Government of Canada has appropriated $20,000, to be expended in the entertainment and in hospitality which it has been considered should be shown to so distinguished an Association. Information of Canada will be given the visitors in their tour of the country by various railways and steamboat lines, which they may choose to select for themselves. Points of special attraction that abound in Canada, and some of the main waterways, canals, ports and cities may be visited, also the chief centres of transportation and traffic, for the purpose of inspection. The Minister of Marine and Fisheries has accepted the honour of being one of the patrons of the Association Congress to be held at Philadelphia.



Opening of Parliament.

A scene on the Rideau Canal—Showing also part of the Driveway, Ottawa.

Information relating to Canada.

The Permanent International Association of Navigation Congresses announces its objects to be the promotion of the progress of inland and maritime navigation.

Canada, from its earliest history, has been intensely interested in navigation and this interest arose from necessity. The settlement of the country took place along its coasts, its bays, estuaries and lakes. Before the construction of railways to reach the inland sections of the country, nearly all communication was by use of the numerous waterways. This important fact forced upon the attention of each province, now included in the Dominion of Canada, the necessity of making improvements in the natural waterways to overcome obstructions to navigation. In connection with inland navigation the settlement of the country naturally caused a heavier traffic, particularly on the St. Lawrence river, Lakes Ontario, Erie, Huron and Lake Superior. Improvements of rivers by regulation, dredging, canals and their dimensions, principals of operation and equipment of locks in the Great Lakes and the St. Lawrence river were matters which early engrossed the attention of the Government of Ontario and Quebec before the union of these two provinces. Afterwards, the improvements to navigation were undertaken by the Government of what has been called "Old Canada." The construction of breakwaters in open roadsteads for harbours of refuge, the dredging of harbours and channels to serve the

On the Rideau Canal and a View of the Driveway, Ottawa.

Inland Navigation in Canada.

internal commerce of the country and for the transfer of commodities to intermediate and terminal ports, were carried on continuously. Legislation, surveys and consequent expenditure were of yearly occurrence. Improvements of this nature occupied the attention also of municipalities and companies, which received from the Government grants of land and charters conditionally upon improvement of navigation.

St. Lawrence Ship Channel.

As the productive powers of the country increased, transportation from inland ports to seaports made it necessary not only to overcome the natural obstructions by construction of additional canals, but by the enlargement and deepening of these works from time to time.

The outstanding and most important works in connection with inland navigation in Canada, are the canals and the construction of the St. Lawrence river ship channel. The natural channel below Montreal at many points was only 10 feet in depth, and the work of cutting a deeper channel was begun in 1841 by the Board of Works of Montreal under the instructions of the Government of the day. But the work was abandoned until the requirements of navigation and the cost of lightering from Quebec to Montreal made it evident that the work should be taken up again to permit ocean going vessels to reach the latter city. The ship-channel was renewed under an Act passed in 1851 and placed under the control of the Harbour Commissioners with authority to effect loans.

When ship channel was begun.

Parliamentary Library.

Sixteen and Eighteen foot channels.

By the year 1853, a channel 150 feet wide and 16 feet deep was obtained. The success of the operations encouraged the Commissioners to further action. The deepening operations were carried on until 18 feet depth, lowest water, was reached. When this was accomplished, the project of still further deepening and enlarging the channel was taken up, and in the year 1865 the channel of 20 feet depth and 300 feet minimum width was finished. The Federal Government in 1873, considering the depth and width insufficient for the rapidly growing trade and increased size of ocean-going vessels, authorized the Commissioners to build or purchase new and more powerful plant and to proceed with deepening until a reliable channel of 25 feet in depth, at low water, could be obtained. This work was accomplished in the year 1882, and the interest on expenditure, from the inception of the work, paid by the Commisssioners out of dues collected from vessels using the channel.

Twenty foot channel.

Twenty-five foot channel.

In 1888, the Federal Government assumed the whole cost and relieved shipping from taxation on account of the "Ship Channel" expenditure. The 27½ foot channel was the next project and then the 30-foot channel with width of 450 feet in the straight sections and from 500 to 750 feet at the bends was taken up. This channel has been available since 1906, and during the last two seasons of navigation ocean steamships of 10,000 tons have majestically sailed up the St. Lawrence from the Strait of Belle Isle to Montreal, with their burdens, a distance of 1,003 miles without stoppage day or night. Some idea of the economical advantages produced by careful engineering work and con-

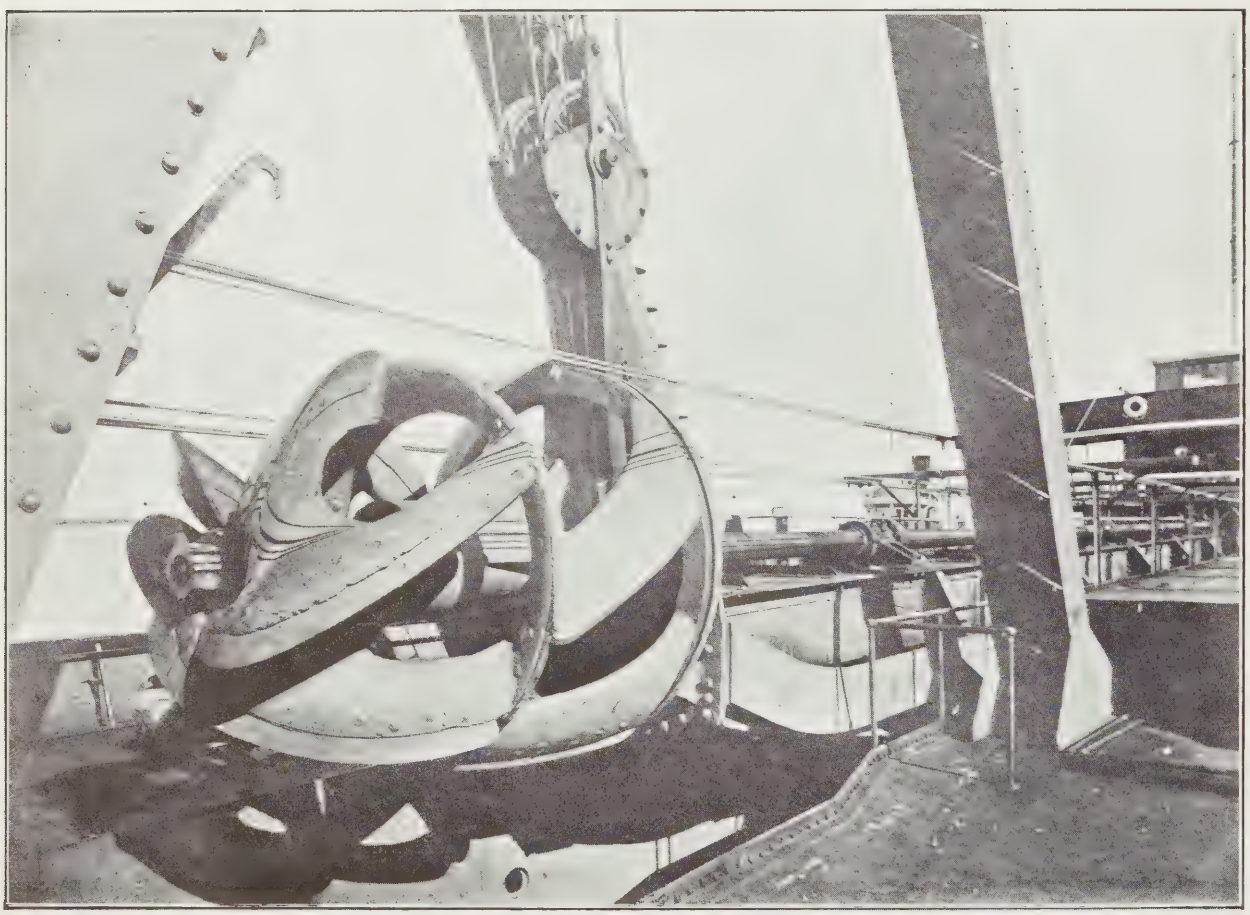
Twenty-seven and one half foot and Thirty foot channels.

Sand-pump Hopper Sea-going Dredge "Galveston" at Beaujeu Channel, below Quebec.

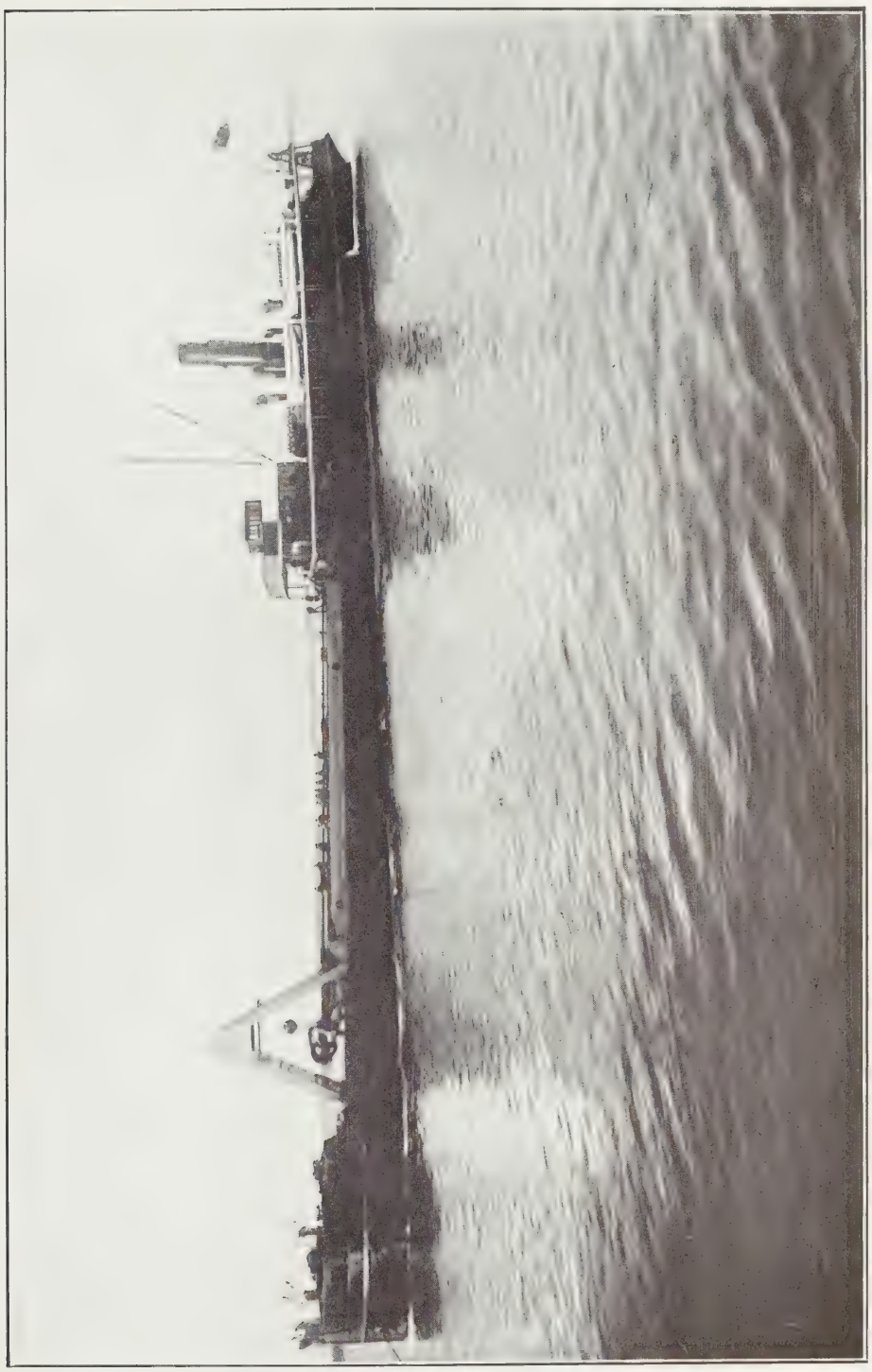
stant toil may be had by stating, in a word, that vessels of 500 tons burthen were compelled to discharge at tide water and the goods placed under tribute for lighterage to Montreal before the channel was undertaken.

Thirty-five foot channel project.

The thirty-five foot project, to allow vessels of 15,000 tons to reach Montreal from sea, has already been begun and some progress made. To those acquainted with engineering work, it will occur at once, that the greater the depth obtained the greater will be the extent of dredging longitudinally. The natural unevenness of the river bottom has shown depths greater than 35 feet, and these divisions require no dredging. The distance between Montreal and Quebec, in the channel, is 160 miles and the length of dredging done in the present or 30-foot channel, is 70 miles; in the deepened channel, the length of dredging will be $82\frac{1}{4}$ miles, of which a distance of about seven miles has been completed. The total length of what is called the "Ship Channel," is 220 miles, extending from Montreal to the Traverse below Quebec, but in this total length, only the distances above stated have required and will require dredging operations. The material in the river bottom varies from hard shale rock to soft blue clay.



Dredge "Beaujeu" No. 8—Cutter-head.



Sea-going Suction Hopper Dredge "Beaujeu" No. 8, before loading.

Of this material about 78,000,000 cubic yards have been removed since the commencement of the work. The cost in round numbers for plant, shops, surveys and dredging has been $12,700,000. The work has been successively under the control of the Montreal Board of Works, Harbour Commissioners and the Department of Public Works, but is now under the Department of Marine and Fisheries.

Total cubic yards of material removed and total cost of channel to date.

Montreal is termed a seaport in consequence of the ship channel to tidal waters and inland navigation westward begins here. The Lachine canal forms the connecting link with the upper St. Lawrence river. The first rapids met above Montreal are the St. Louis rapids, generally called the Lachine rapids, and these formed the first obstruction to navigation ascending the river. Towards the end of the last century the necessity of establishing easy and direct communication with the upper St. Lawrence river and the Great Lakes, was recognised and four small canals were constructed. The locks were of cut stone and only 6 feet wide with $2\frac{1}{2}$ feet of water on the sills. The primitive attempts at artificial navigation, were, in a few years, improved upon by the Government of Quebec. Various progressive changes were made until Confederation, when the Federal Government decided to give the whole line, where artificial navigation had been adopted, between Lachine and Sault Ste. Marie, a depth sufficient for vessels of 12 feet draught to pass without interruption. The further deepening of these canals on the main artery of inland navigation was vigorously pursued. In this work minute surveys were made, and a large amount of labour and money expended in overcoming the various natural obstacles in the way of successful navigation.

Lachine Canal.

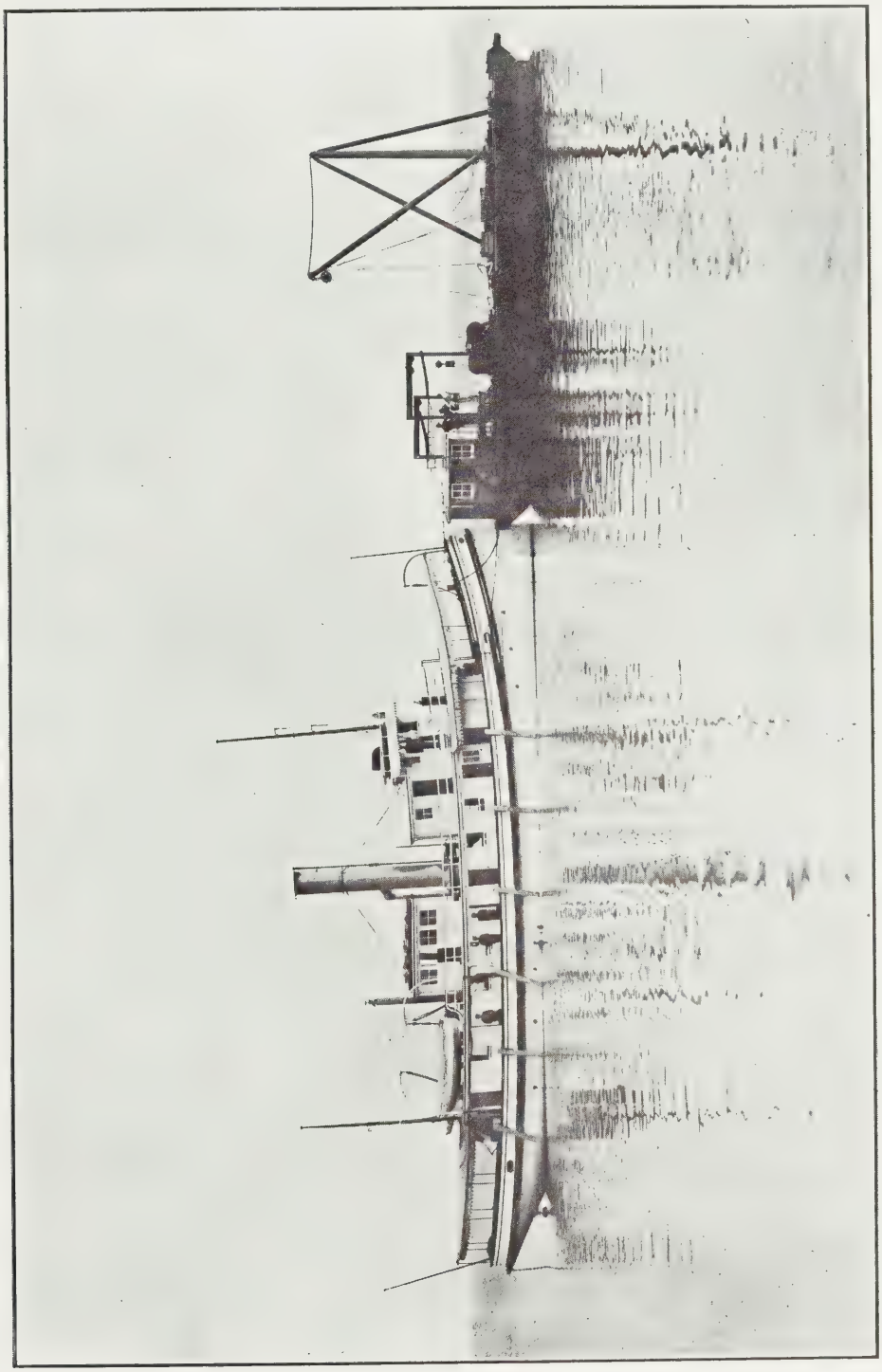
Canals in the Great Lakes.

Twenty-ton rock-cutter—Side view.

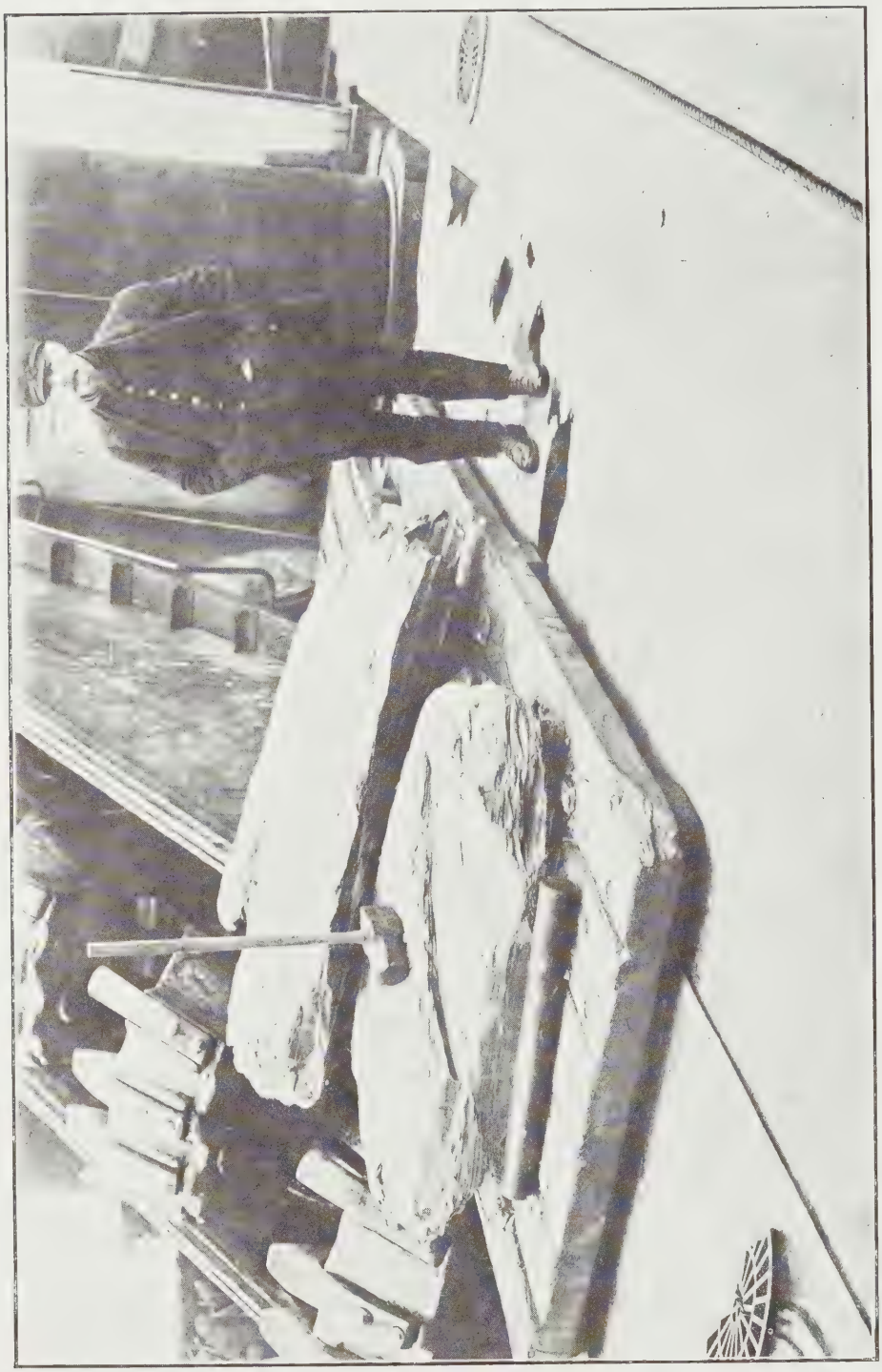
Locks were built in nearly all of the canals; harbours and channels deepened, and improvements of all kinds made, until the present system was finally developed. The Welland canal was necessarily the greatest link in the chain of Great Lake navigation, owing to the height to be overcome between Lakes Erie and Ontario.

Navigation improvements, not only to the westward and then eastward to the sea from Montreal had been carried out by connection of the waters in the provinces of Ontario and Quebec, but a new avenue for

Lake Champlain.



One of the Ship Channel sweeping outfits.



Shale rock dredged by Dredge No. 3 at Cap St. Charles, without the aid of explosives.

trade and commerce was opened up by the utilization of the Richelieu river, in which dams and locks were constructed, to communicate with Lake Champlain and southward to sea board at New York. The distance from Montreal to New York is 457 miles, and within this stretch, 85 miles of artificial waterway was completed. Communication between Montreal and Kingston was projected by utilizing as part of the system ordnance canals and locks on the Ottawa and Rideau rivers. These ordnance canals were transferred by the Imperial Government in 1856. They were begun as early as 1819 and completed in 1833. Since Confederation the Federal Government has enlarged and improved these canals at several points to accomodate them to the traffic of the country.

Canals on the Ottawa and Rideau Rivers.

CANALS CONNECTING THE GREAT LAKES.

The following diagrams and detailed descriptions of the inland navigation canals were furnished by the Department of Railways and Canals, and are abstracts from the annual report of that Department.

Plans and Sections showing Dimensions of the Smallest Lock on each of the Canadian Canal System except the Trent Canal, which is uncompleted.

There are no locks on the through route between Lake Superior and Montreal of less dimension than those of the Welland Canal Locks.

CANALS.

The following statements give in concise form the essential features of the government canal works and the intermediate water navigation:

The canal systems of the Dominion, under government control in connection with lakes and navigable rivers are as follows:—

First.—The through route between Montreal and Port Arthur or Fort William on the west shore of Lake Superior (14 feet minimum depth of water.)

	Statute Miles.
1. Lachine canal	8½
Lake St. Louis and River St. Lawrence	16
2. Soulanges canal	14
Lake St. Francis and River St. Lawrence	33
3. Cornwall canal	11
River St. Lawrence	5
4. Farran's Point canal	1¾
River St. Lawrence	10
5. Rapide Plat canal	3¼
River St. Lawrence	4
6. Galops canal	7¼
River St. Lawrence and Lake Ontario	236
7. Welland canal	26¾
Lake Erie, Detroit river, Lake St. Clair, Lake Huron, etc	580
8. Sault Ste. Marie canal	1¼
Lake Superior to Port Arthur or to Fort William	273
Total	1,230¼
To Duluth	1,354
Chicago	1,286

Second.—Montreal to International Boundary, near Lake Champlain.

	Statute Miles.
1. St. Lawrence river to Sorel	46
2. Sorel, via Richelieu river, to St. Ours lock	14
3. St. Ours lock	⅛
4. Richelieu river, St. Ours lock, to Chambly canal	32
5. Chambly canal	12
6. Chambly canal to boundary line	23
Total	127⅛

Third.—Montreal to Ottawa.

	Statute Miles.
1. Lachine canal	8½
2. Lake St. Louis	15
St. Anne's lock at outlet of Ottawa river	⅛
Lake of Two Mountains and Ottawa river	27
3. Carillon canal	¾
Ottawa river	6¼
4. Grenville canal	5¾
Ottawa river to Ottawa	50
Total	119⅛

Fourth.—Ottawa to Kingston and Perth.

	Statute Miles.
1. Rideau canal	126¼

Fifth.—Lake Ontario, at Trenton, to Lake Huron.

1. Trent canal,—not completed.

Sixth.—Atlantic Ocean to Bras d'Or Lakes, Cape Breton.

	Statute Miles.
1. St. Peter's canal	½

Stone-lifter No. 4 working in ship channel, St. Lawrence River.

RIVER ST. LAWRENCE AND LAKES.

The River St. Lawrence, with the system of canals established on its course above Montreal, and the Lakes Ontario, Erie, St. Clair, Huron and Superior, with connecting canals, afford a course of water communication extending from the Straits of Belle Isle to Port Arthur or Fort William on the west coast of Lake Superior, a distance of 2,233 statute miles. The distance to Duluth is 2,357 miles. The distance to Chicago, 2,289 miles.

Navigation, which is closed by ice during the winter months, opens about the end of April.

The difference in level between the point on the St. Lawrence, near Three Rivers, where the tidal influence ceases, and Lake Superior, is about 600 feet.

The Dominion canals, constructed between Montreal and Lake Superior, are the Lachine, Soulanges, Cornwall, Farran's Point, Rapide Plat, Galops, Murray, Welland, and Sault Ste Marie. Their aggregate length is 73 miles; total lockage (or height directly overcome by locks), 551 feet. The number of locks through which a vessel would pass in its passage from Montreal at the head of ocean navigation, to the head of Lake Superior, is 48. The Soulanges canal takes the place of the Beauharnois canal, abandoned for navigation purposes.

Communication between Lakes Huron and Superior is obtained by means of the Canadian Sault Ste Marie canal, and also by the St. Mary's Falls canals, situated on the United States side of the River St. Mary.

Lachine Canal—Feeding weir at Lachine.

Lachine Canal.

Improvements of the United States channels in St. Mary's river through Hay lake, east of the Sault Ste. Marie, have been carried on for several years past. The dredged areas now total 34 miles in length, with a minimum width of 300 feet, which is increased at angles and other critical points to 1,000 feet. The depth is 20 feet at the mean stage of water. In the year 1903 excavation was commenced to afford 21 feet at the lowest stage of water.

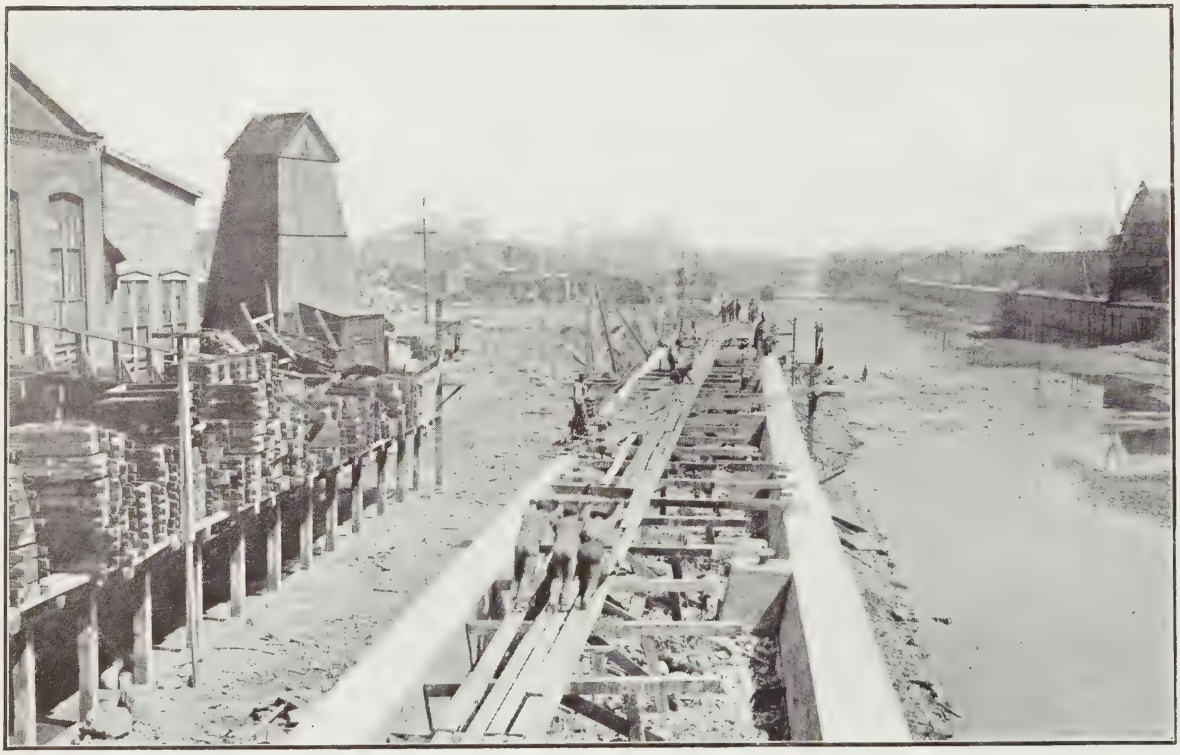
It is important to note that the enlargement of canals on the main route between Montreal and Lake Erie comprises locks of the following minimum dimensions: Length, 270 feet; width, 45 feet; depth of water on sills, 14 feet. The length of the vessels to be accommodated is limited to 255 feet. At Farran's, in the canal of that name, the lock is 800 feet long. A similar lock is built at Iroquois on the Galops canal, the object being to pass a full tow at one lockage.

LACHINE CANAL.

Length of canal	8½ statute miles.
Number of locks	5
Dimensions of locks	270 feet by 45 feet.
Total rise of lockage	45 feet.
Depth of water on sills, at two locks	18 feet.
Depth of water on sills, at three locks	14 feet.
Average width of new canal	150 feet.

The old lift locks, 200 feet by 45 feet, are still available, with 9 feet of water on mitre sills. The two lower north locks. however, have been lengthened to 270 feet, and have 16½ feet of water on the sills.

Lachine Canal—Upper Entrance.



Lachine Canal—New pier under construction.

Soulanges Canal—Lock No. 8.

Soulanges Canal—Lock No. 3.

Soulanges Canal—Lower entrance.

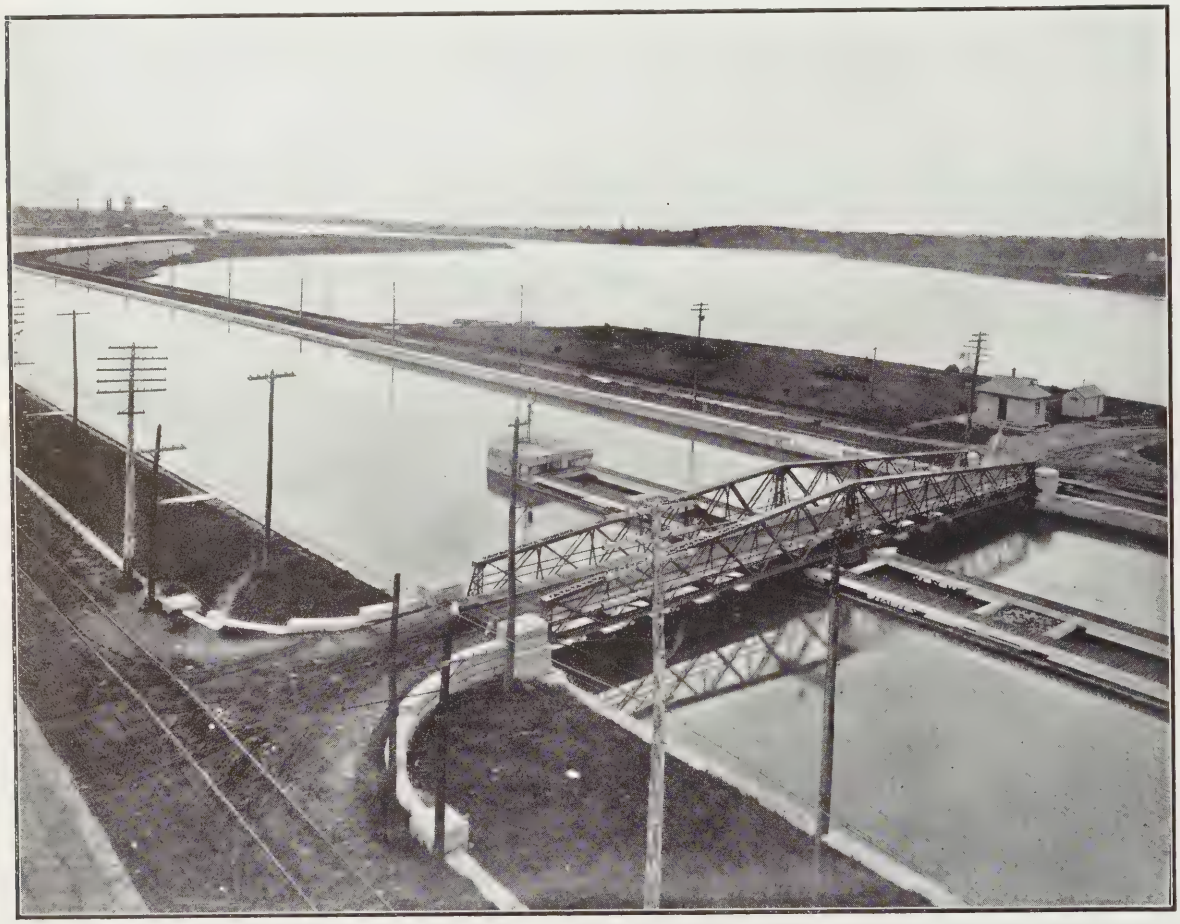
The canal consists of one channel, with two distinct systems of locks, the old and the enlarged. There are two lock entrances at each end.

SOULANGES CANAL.

Length of canal	14 statute miles.
Number of locks—	
Lift	4
Guard	1
Dimensions of locks	280 feet by 45 feet.
Total rise of lockage	84 feet.
Depth of water on sills	15 feet.
Breadth of canal at bottom	100 feet.
Breadth of canal at water surface	164 feet.

The canal extends from Cascade Point to Coteau Landing, overcoming the Cascades rapids, Cedar rapids and Coteau rapids.

From the head of the Lachine to the foot of the Soulanges canal the distance is sixteen miles.



Cornwall Canal—Swing-bridge at Cornwall.

Cornwall Canal—Regulating weir.

Cornwall Canal—Old and new locks.

CORNWALL CANAL.

Length of canal	11 statute miles.
Number of locks	6
Dimensions of locks	270 feet by 45 feet.
Total rise of lockage	48 feet.
Depth of water on sills	14 feet.
Breadth of canal at bottom	100 feet.
Breadth of canal at water surface	164 feet.

The old lift locks, 200 feet by 50 feet, are also available with nine feet of water on mitre sills.

From the head of the Soulanges to the foot of the Cornwall canal there is a stretch through Lake St. Francis 33 miles, which is navigable for vessels drawing fourteen feet.

The Cornwall canal extends past the Long Sault rapids from the town of Cornwall to Dickinson's Landing.

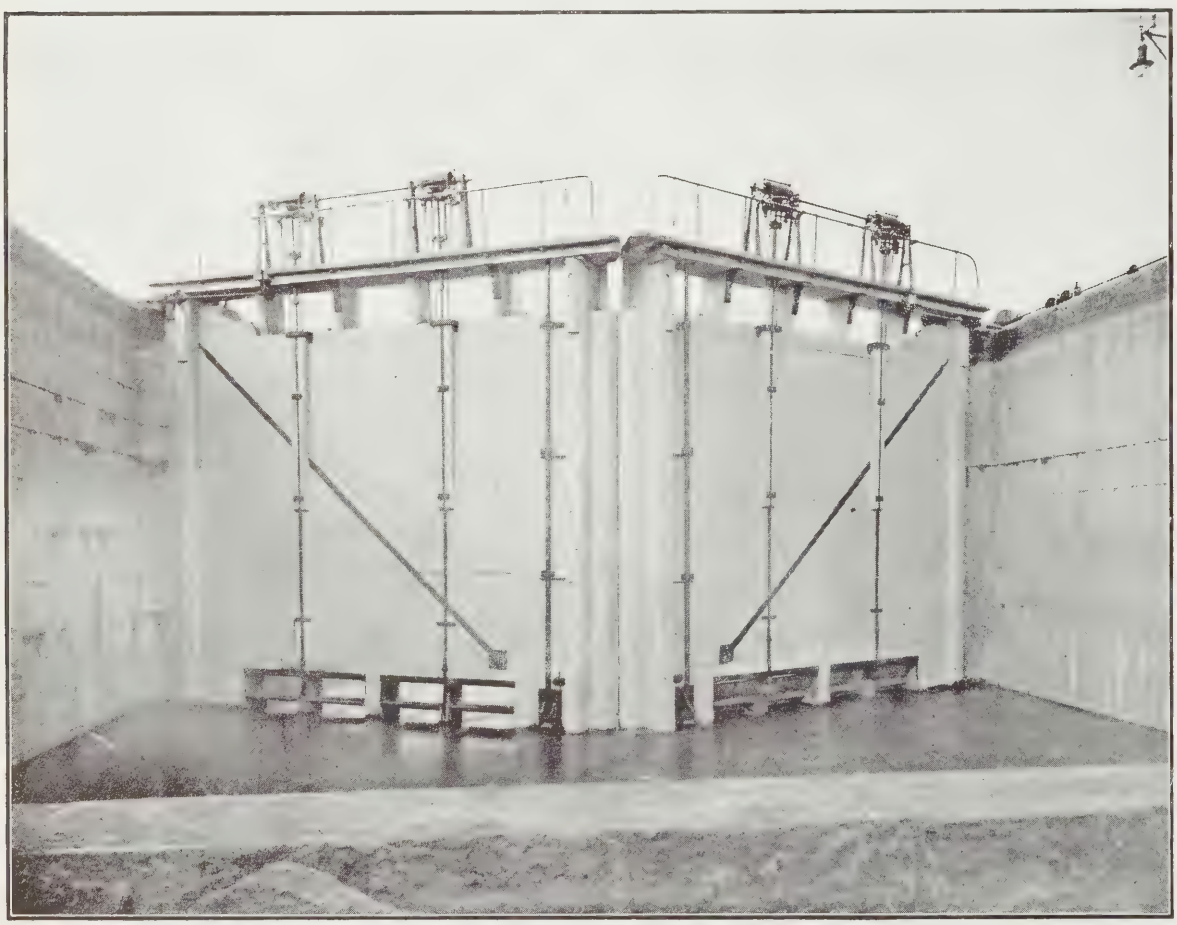
WILLIAMSBURG CANALS.

The Farran's Point, Rapide Plat and Galops canals are collectively shown as the Williamsburg canals.

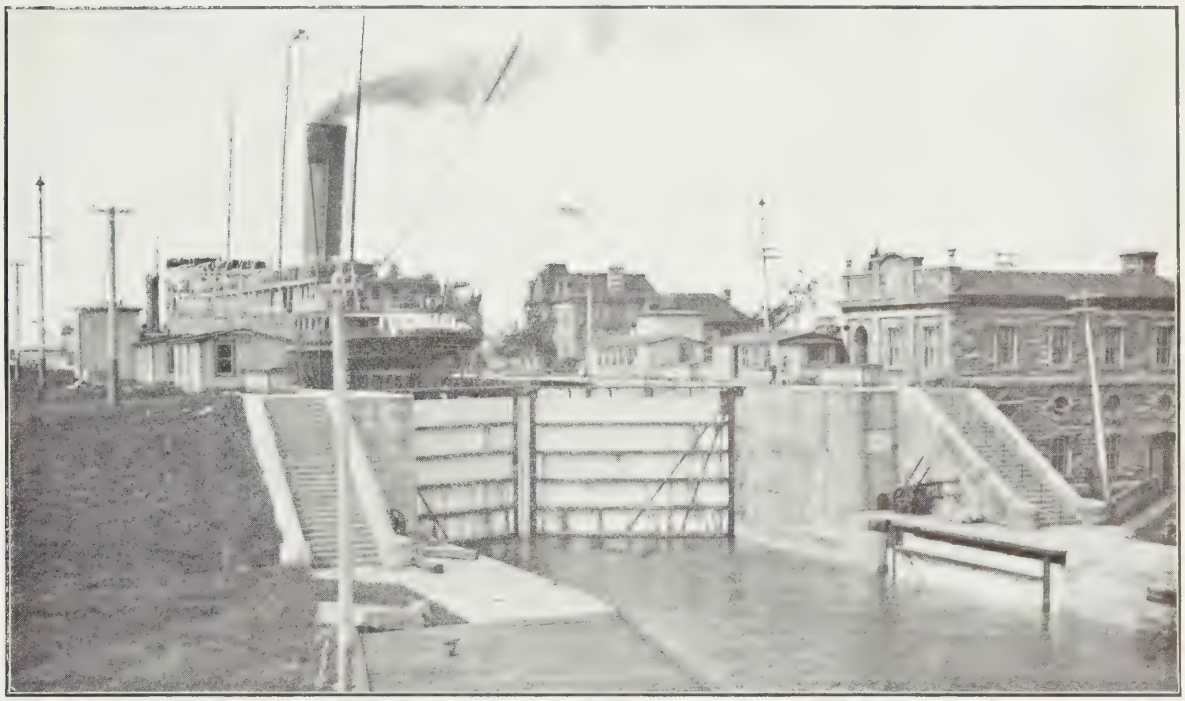
FARRAN'S POINT CANAL.

Length of canal	1¼ mile.
Number of locks	1
New lock	800 feet by 50 feet.
Old lock	200 feet by 45 feet.
Total rise of lockage	3½ feet
Depth of water on sills of new lock	14 feet.
Depth of water on sills of old lock	9 feet.
Breadth of Canal at bottom	90 feet.
Breadth of canal at water surface	154 feet.

From the head of the Cornwall canal to the foot of Farran's Point canal, the distance on the



Cornwall Canal—New lock.



Sault Ste. Marie Lock—Showing the SS. "Assiniboia" of the C.P.R., and a freighter.

Sault Ste. Marie—A blockade near the lower approach—Nine vessels in view.

River St. Lawrence is five miles. The latter canal enables vessels ascending the river to avoid Farran's Point rapid, passing the full tow at one lockage. Descending vessels run the rapids with ease and safety.

RAPIDE PLAT CANAL.

Length of canal	$3\frac{3}{4}$ miles.
Number of locks	2
Dimensions of locks	270 feet by 45 feet.
Total rise or lockage	$11\frac{1}{2}$ feet.
Depth of water on sills	14 feet.
Breadth of canal at bottom	80 feet.
Breadth of canal at water surface	152 feet.

F

The old lift-lock, 200 feet by 45, is also available, with nine feet of water on mitre sills.

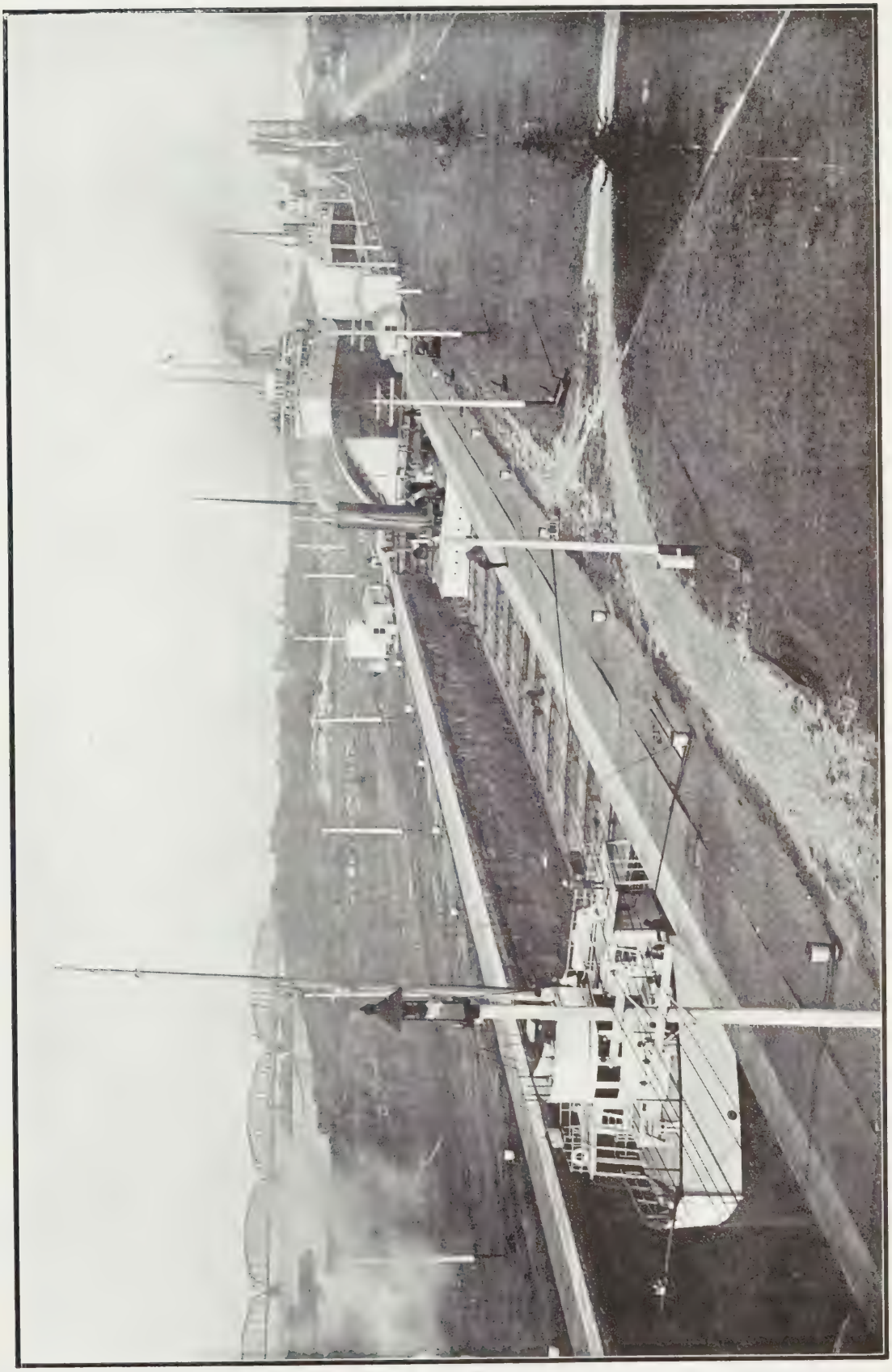
From the head of Farran's Point canal to the foot of Rapide Plat canal, there is a navigable stretch of $10\frac{1}{2}$ miles. The canal was formed to enable vessels ascending the river to pass the rapids at that place. Descending vessels run the rapids safely.

GALOPS CANAL.

Length of canal	$7\frac{1}{3}$ miles.
Number of locks	3
Dimensions of locks, one of which is a guard-lock.	1–800 by 50. 1–270 by 45. 1 –303 by 45.
Total rise or lockage	$15\frac{1}{2}$ feet.
Depth of water on sills	14 feet.
Breadth of canal at bottom	80 feet.
Breadth of canal at surface of water	144 feet.

From the head of the Rapide Plat to Iroquois, at the foot of the Galops canal, the St. Lawrence is navigable $4\frac{1}{2}$ miles. The canal enables vessels to overcome the rapids at Pointe aux Iroquois, Port Cardinal and the Galops.

Sault Ste. Marie—SS. Huronia—Length, 328 ft.; beam, 43 ft.



Locks—Sault Ste. Marie.

Sault Ste. Marie.

MURRAY CANAL.

Length between eastern and western piers.	5 1-6 miles.
Breadth at bottom	80 feet.
Breadth at water surface	120 feet.
Depth below lowest known lake level	11 feet.
Number of locks.	

This canal extends through the Isthmus of Murray, giving connection westward between the headwaters of the Bay of Quinté and Lake Ontario, and thus enabling vessels to avoid the open lake navigation.

WELLAND CANAL.

Main line from Port Dalhousie, Lake Ontario, to Port Colborne, Lake Erie.

	Old line.	Enlarged or new line.
Length of canal	27½ miles.	26¾ miles.
Pairs of guard-gates (formerly 3)		1
Number of locks:		
Guard	1	1
Lift	26	25
Dimensions	1 (tidal) 230 x 45 1 lock 200 x 45 1 lock 200 x 45 24 locks 150 x 45	270 feet x 45 feet.
Total rise or lockage	326¾ feet.	326¾ feet.
Depth of water on sills	10¼ feet.	14 feet.

WELLAND RIVER BRANCHES.

Length of canal:	
Port Robinson Cut to River Welland.	2,622 feet.
From the canal at Welland to the river, via lock at Aqueduct	300 feet.
Chippewa Cut to River Niagara	1,020 feet.
Number of locks—one at Aqueduct and one at Port Robinson	2
Dimensions of locks	150 by 26½ feet.
Total lockage from the canal at Welland down to River Welland	10 feet.
Depth of water on sills	9 feet 10 inches.

GRAND RIVER FEEDER.

Length of canal	21 miles.
Number of locks	2
Dimensions of locks	1 of 150 by 26½ ft. 1 of 200 by 45 ft.
Total rise or lockage	7 to 8 feet.
Depth of water on sills	9 feet.

PORT MAITLAND BRANCH.

Length of canal	1¾ miles.
Number of locks	1
Dimensions of locks	185 feet by 45 feet.
Depth of water on sills	7½ feet.
Total rise or lockage	7 to 8 feet.

Locks---Sault Ste. Marie—The largest in the world.

The Welland canal has two entrances from Lake Ontario, at Port Dalhousie, one for the old, the other for the new canal.

From Port Dalhousie to Allanburg, $11\frac{3}{4}$ miles, there are two distinct lines of canal in operation, the old line and the enlarged or new line.

From Allanburg to Port Colborne, a distance of 15 miles, there is only one channel, the old canal having been enlarged.

From the head of the Welland canal there is a deep water navigation through Lake Erie, the Detroit river, Lake St. Clair. the St. Clair river, Lake Huron and River St. Mary to the Sault canal, a distance of about 580 miles. From the Sault the distance through Lake Superior to Port Arthur is 274 miles, and to Duluth 397 miles.

SAULT STE. MARIE CANAL.

Length of canal, between the extreme ends of the entrance piers	$1\frac{1}{10}$ miles or 7,472 feet.
Number of locks	1
Dimension of locks	900 feet by 60 feet at water level; width at lock bottom, 59 feet.
Depth of water on sills (at lowest known water level	19 feet 3 inches.
Total rise or lockage (mean)	19 feet.
Breadth of canal at bottom	141 feet 8 inches.
Breadth at surface of water	150 feet.

This canal has been constructed through St. Mary's island, on the north side of the rapids of the River St. Mary, and, with that river, gives communication on Canadian territory between Lakes Huron and Superior.

MONTREAL, OTTAWA AND KINGSTON.

This route extends from the harbour of Montreal to the port of Kingston, passing through the Lachine canal, the navigation section of the lower River Ottawa, and the Ottawa canals to the city of Ottawa; thence by the River Rideau and the Rideau canal to Kingston, on Lake Ontario—a total distance of 245 miles.

After leaving the Lachine canal the works constructed to overcome difficulties of navigation are:—

OTTAWA RIVER CANALS.

The Ste. Anne's Lock.
Carillon Canal.
Grenville Canal.

RIDEAU CANAL.

The total lockage (not including that of the Lachine canal) is 509 feet (345 rise, 164 fall) and the number of locks is 55.

The following table exhibits the intermediate distances from Montreal harbour:—

Sections of Navigation.	Intermediate Distance.	Total Distance from Montreal.
	Miles.	Miles.
The Lachine Canal	$8\frac{1}{2}$	
FromLachine to Ste. Anne's Lock	15	$23\frac{1}{2}$
Ste. Anne's Lock and piers	$\frac{3}{4}$	$23\frac{5}{8}$
Ste. Anne's Lock to Carillon Canal	$27\frac{3}{8}$	$50\frac{3}{8}$
The Carillon Canal	$\frac{3}{4}$	$51\frac{5}{8}$
From Carillon to Grenville Canal	$6\frac{1}{4}$	$57\frac{3}{8}$
The Grenville Canal	$5\frac{3}{4}$	$63\frac{3}{8}$
From the Grenville Canal to entrance of Rideau Navigation	56	$119\frac{3}{8}$
Rideau Navigation ending at Kingston	$126\frac{1}{4}$	$245\frac{5}{8}$

STE. ANNE'S LOCK.

	New Lock.	Old Lock.
Length of canal	$\frac{1}{8}$ mile.	$\frac{1}{8}$ mile.
Number of locks	1	1
Dimensions of locks	200 x 45 feet.	190 x 45 feet.
Total rise of lockage	3 feet.	3 feet.
Depth on sills	9 feet.	6 feet.

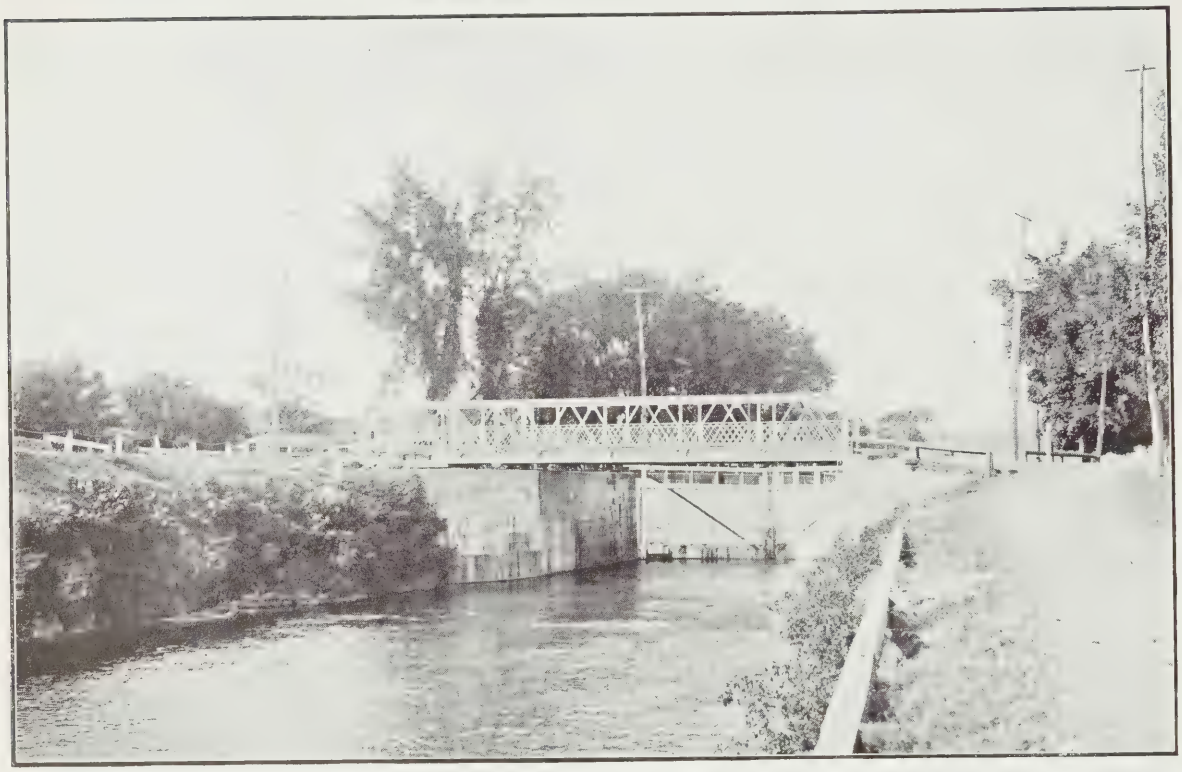
This work, with guide piers above and below surmounts the St. Anne's rapids between Ile Perrot and the head of the Island of Montreal, at the outlet of that portion of the River Ottawa which forms the Lake of Two Mountains, 23. miles from Montreal harbour.

THE CARILLON CANAL.

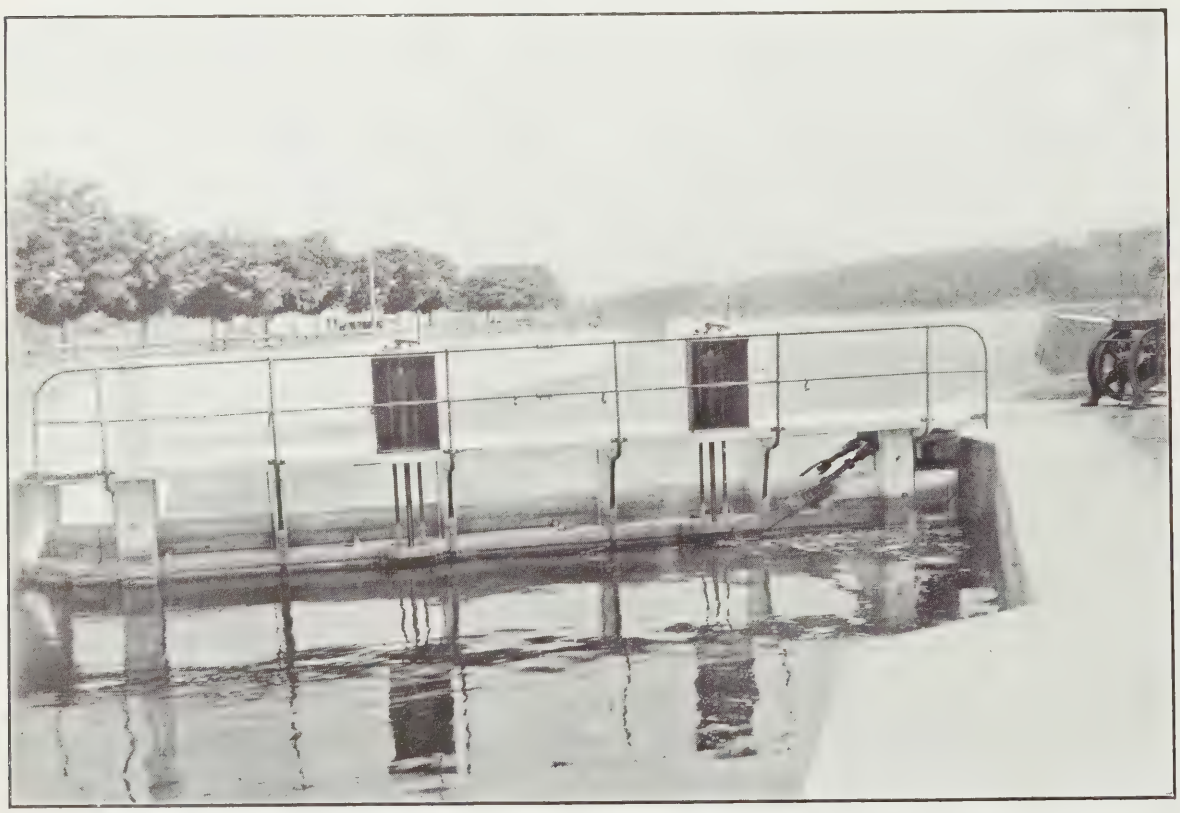
Length of canal	$\frac{3}{4}$ mile.
Number of locks	2
Dimensions of locks	200 x 45 feet.
Total rise or lockage	16 feet.
Depth of water on sills	9 feet.
Breadth of canal at bottom	100 feet.
Breadth of canal at water surface	110 feet.

St. Anne's Lock—On the Ottawa River.

Ottawa River—St. Anne's Lock.



Grenville Canal—Lock No. 7.



Grenville Canal—Greece's Point from Lock No. 3.

This canal overcomes the Carillon rapids.

From Ste. Anne's lock to the foot of the Carillon canal is a navigable stretch of 27 miles, through the Lake of Two Mountains and River Ottawa.

By the construction of the Carillon dam across the River Ottawa the water at that point is raised 9 feet, enabling the river above to be used for navigation.

GRENVILLE CANAL.

Length of canal	5¾ miles.
Number of locks	5
Dimensions of locks	200 x 45 feet.
Total rise or lockage	43¾ feet.
Depth of water on sills	9 feet.
Breadth of canal at bottom	40 to 50 feet.
Breadth of canal at surface of water	50 to 80 feet.

This canal, by which the Long Sault rapids are avoided, is about 56 miles below the city of Ottawa, up to which point the River Ottawa affords unimpeded navigation.

RIDEAU NAVIGATION.

The Rideau system connects the River Ottawa at the city of Ottawa with the eastern end of Lake Ontario at Kingston.

Length of navigation	126¼ miles.
Number of locks from Ottawa to Kingston	34 ascending. 14 descending.
Total lockage, 457½ feet	292¼ feet rise and 165¼ fall. at high water.
Dimensions of locks	134 x 33 feet.
Depth of water on sills	5 feet.
Navigation depth through the several reaches	5 feet.
Breadth of canal reaches at bottom	54 feet in rock. 60 feet in earth.
Breadth of canal at surface of water	80 feet in earth.

PERTH BRANCH.

Length of canal	7 miles.
Number of locks	2
Dimensions of locks	134 feet x 33 feet.
Total rise or lockage	26 feet.
Depth of water on sills	5 feet 6 inches.
Length of dam	200 feet.
Breadth of canal at surface of water	80 feet.
Breadth of canal at bottom	40 feet in rock. 60 feet in clay.

Carillon Canal—Lock No. 2.

Grenville Canal—Upper entrance.

Rideau Canal.

The Perth branch of the Rideau canal affords communication between Beveridge's bay, on Lake Rideau, and the town of Perth.

The summit level of the Rideau system is at upper Lake Rideau, but several of the descending reaches are also supplied by waters which have been made tributary to them. The following description gives the sources of supply:—

From the summit, the route towards Ottawa follows the Rideau river, and that towards Kingston follows the River Cataraqui. The supply of water for the canal is derived from the reserves given in detail below.

These may be divided into three systems, viz;

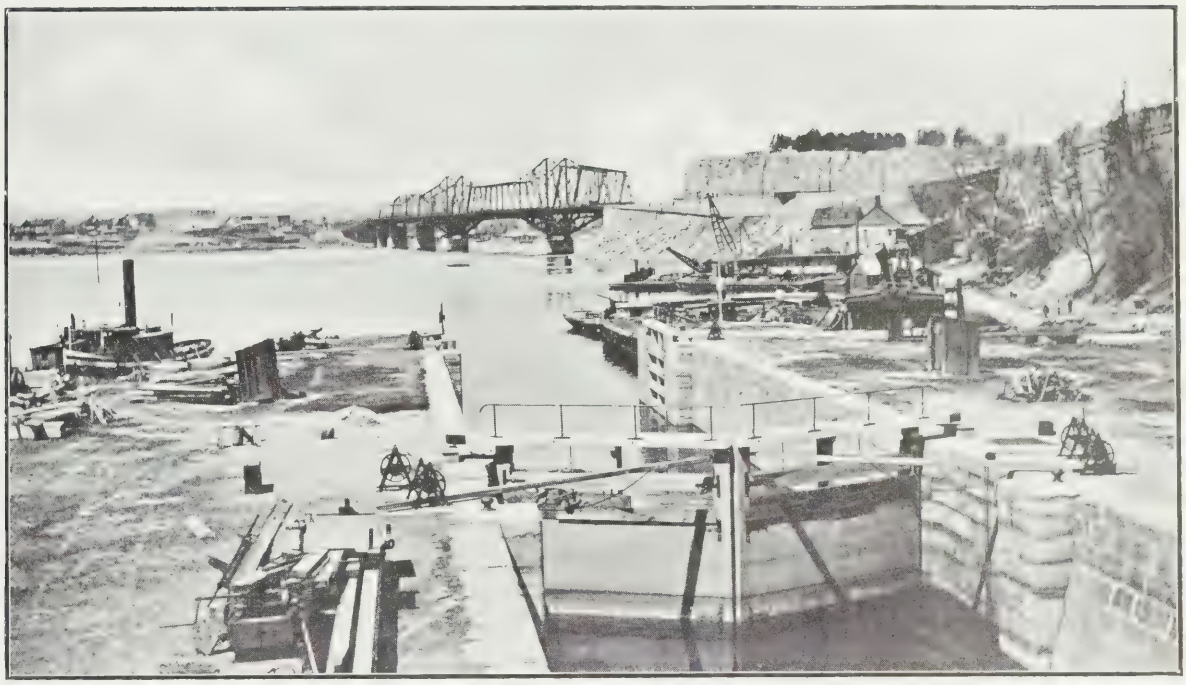
1. The summit level, supplied by the Wolf lake system.

2. The eastern descending level to Ottawa, supplied by the River Tye system, discharging into Lake Rideau.

3. The southwest descending level to Kingston, supplied by the Mud lake system, formerly known as the Devil lake system, discharging into Lake Opinicon.

Lake Opinicon receives the waters of Buck lake and Rock lake.

Rideau Canal—Westburn Lock Station.



Rideau Canal—Entrance from the Ottawa River, in the City of Ottawa.

Rideau Canal.

Rideau Canal—Davis' Lock Station.

Rideau Canal—Kilmarnock Lock.

All these waters on the descending level, supplemented by those of Lake Loughboro', flow to Cranberry lake, which, discharging through Round Tail outlet, forms the River Cataraqui. The river, rendered navigable by dams at various points, affords a line of navigation to Kingston.

RICHELIEU AND LAKE CHAMPLAIN.

This system, commencing at Sorel, at the confluence of the Rivers St. Lawrence and Richelieu, 46 miles below Montreal, extends along the River Richelieu, through the St. Ours lock to the basin at Chambly; thence, by the Chambly canal, to St. Johns, and up the River Richelieu to Lake Champlain. The distance from Sorel to the boundary line is 81 miles.

At Whitehall, the southern end of Lake Champlain is entered, and connection is obtained with the River Hudson, by which the city of New York is directly reached.

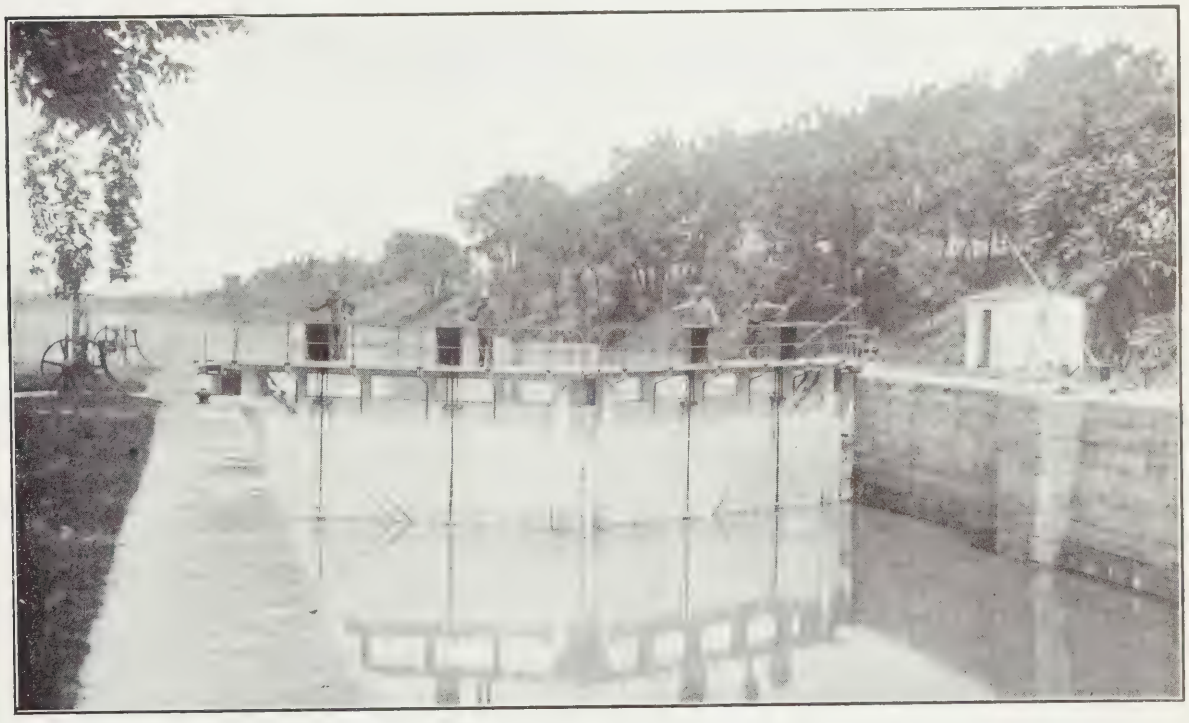
The following table shows the distances between Sorel and New York:—

Sections of Navigation.	Intermediate Distance.	Total Distances.
	Miles.	Miles.
Sorel to St. Ours Lock	14	14
St. Ours Lock to Chambly Canal	32	46
Chamby Canal	12	58
Chambly Canal to boundary line	23	81
Boundary line to Champlain Canal	111	192
Champlain Canal to junction with Erie Canal	66	258
Erie Canal from junction to Albany	7	265
Albany to New York	146	411

ST. OURS LOCK AND DAM.

Length	¼ mile.
Number of locks	1
Dimensions of lock	200 feet by 45 feet.
Total rise of lockage	5 feet.
Depth of water on sills	7 feet.
Length of dam in western channel	690 feet.

At St. Ours, 14 miles from Sorel, the River Richelieu is divided by a small island into two channels. The St. Ours lock is in the eastern channel.



Richelieu Canal—St. Ours Lock—Lower gates.

There is a navigable depth in the Richelieu of 7 feet between St. Ours lock and Chambly basin, a distance of 32 miles.

CHAMBLY CANAL.

Length of canal	12 miles.	
Number of locks	9	
Dimensions of locks -		
Guard lock No. 1 at St. Johns	122 feet	From 22½
Lift lock No. 2	124 feet	to 24 feet
Lift locks Nos. 3, 4, 5, 6	118 feet	wide.
Lift locks Nos. 7, 8, 9, combined	125 feet.	
Total rise or lockage	74 feet.	
Depth of water on sills	6½ feet.	
Breadth of canal at bottom	36 feet.	
Breadth of canal at surface of water	60 feet.	

This canal succeeds the 32 miles of navigable water between St. Ours lock and Chambly basin. The canal overcomes the rapids between Chambly and St. Johns.

TRENT CANAL.

The term "Trent Canal" is applied to a series of water stretches, which do not, however, form a connected system of navigation, and which, in the present condition, are efficient only for local use. By various works this local use has been extended, and by others, now in progress and contemplation, this will become a through route between Lake Ontario and Lake Huron.

Chambly Canal—Richelieu River.

The series is composed of a chain of lakes and rivers, extending fron Trenton, at the mouth of the River Trent, on the Bay of Quinté, Lake Ontario, to Lake Huron.

Many years ago the utilizing of these waters for the purpose of through water communication between Lake Huron and Lake Ontario was projected.

The course, as originally contemplated and modified, is as follows:—

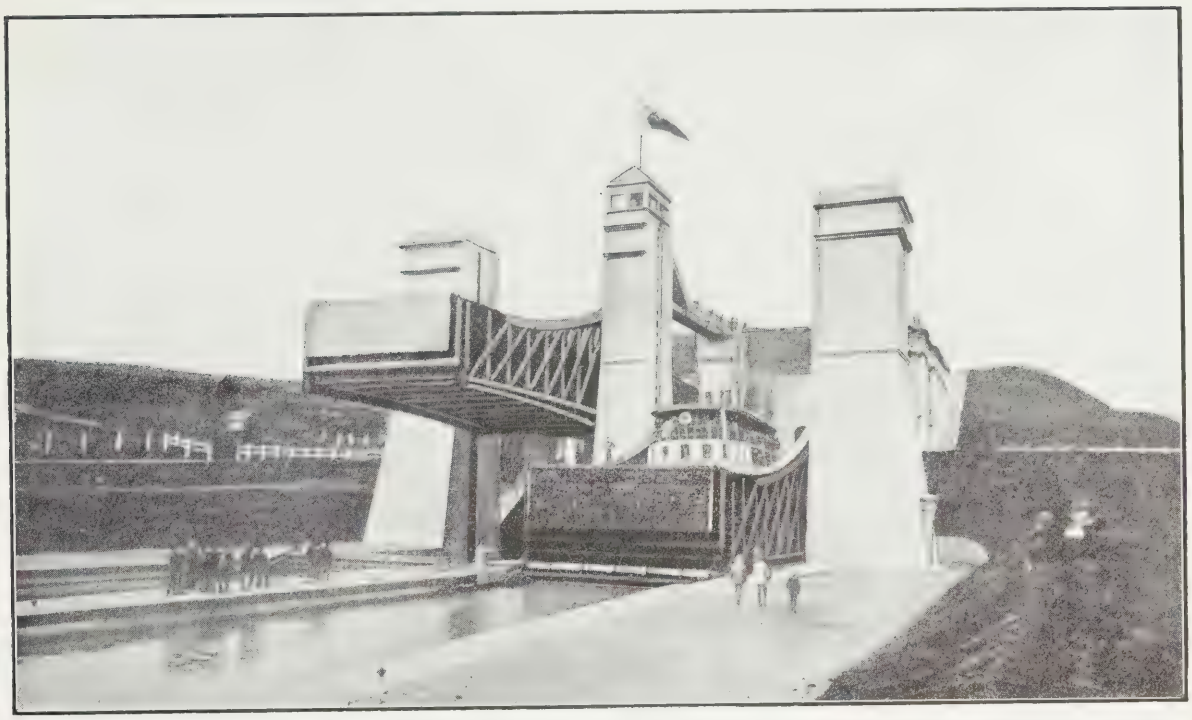
Through the River Trent, Rice lake, the River Otonabee and Lakes Clear, Stony, Lovesick, Deer, Buckhorn, Chemong, Pigeon, Sturgeon

Chambly Canal.

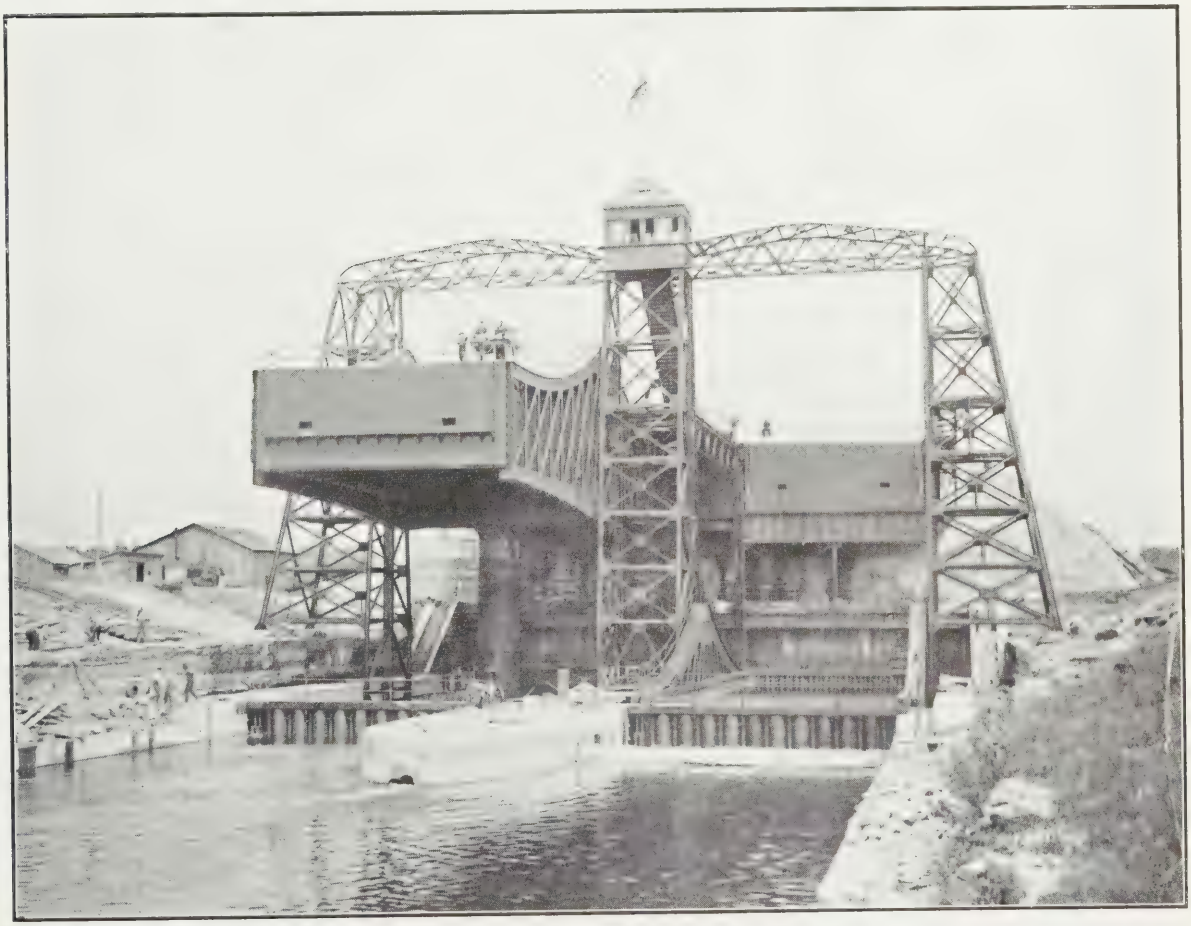
and Cameron to Lake Balsam, the summit water about 165 miles from Trenton; from Lake Balsam by a canal and the river Talbot to Lake Simcoe. The route from Lake Simcoe to Georgian bay, Lake Huron has not yet been determined.

The full execution of the scheme, commenced by the imperial government in 1837, was deferred. By certain works, however, below specified, sections of these waters have been made practicable for navigation, and the whole scheme is now being carried out. A branch of the main route, extending from Sturgeon lake south, affords communication with the town of Lindsay and, through Lake Scugog, to Port Perry, a distance of 180 miles from Trenton.

The works by which the Trent navigation has been improved to date comprise short canals with locks at Hastings, Peterborough, Peterborough to Lakefield 7 locks, one being a hydraulic lift; Young's Point, Burleigh Falls, Lovesick, Buckhorn, Bobcaygeon, Fenelon Falls, Rosedale, and six locks between Balsam and Simcoe lakes, one being a hydraulic lift; also lock and dam at Lindsay.

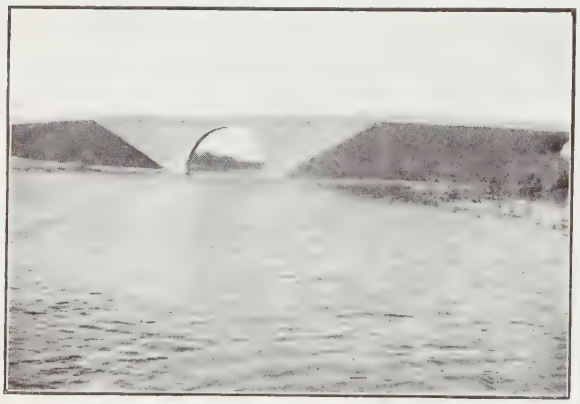


Hydraulic Lift Lock—Peterboro', Ont. Vertical lift 66 feet. The largest in the world.



Trent Canal—Kirkfield hydraulic lift lock.

Also dams at Healey Falls, Hastings, Peterborough, Peterborough to Lakefield, 6; Young's Point, Burleigh, Lovesick, Buckhorn, Bobcaygeon, Fenelon Falls, Rosedale, and three between Balsam and Simcoe lakes.



Trent Canal—Concrete bridge.

Bridges also have been built at many of the locks and at other places.

For convenience the canal may be divided into the following divisions, the lengths being given:—

ONTARIO-RICE LAKE DIVISION.

Embracing the canal and river navigation between Trenton, on the Bay of Quinté, to Rice lake, 66.00 miles.

The all-river route from Trenton, on the Bay of Quinte, to Rice lake was fully decided upon by the government during the session of 1907, and the work of construction was begun that fall. The improvement is carried out on the principle of damming the river at suitable points by means of dams, and connecting the pools thus created by means of locks and short stretches of canal. The locks on this division will be 175 feet long, 33 feet wide, with 8 feet 4 inches of water on the sills. In the reaches there will be a minimum depth of 9 feet of water. For the purpose of construction, this division of 57 miles has been divided into seven sections, all of which are under contract. Rice lake is 369 feet above low water level of Lake Ontario, which height will be overcome by 18 locks.

PETERBOROUGH-RICE LAKE DIVISION.

Embracing that stretch of river and lake navigation from the lower end of Rice Lake to Peterborough, 30.00 miles.

This division is navigable with a minimum depth of 6 feet.

At Hastings is a masonry lock and timber dam which maintain navigation on the Trent river, Rice lake and the Otonabee river to Peterborough, a distance of about 36 miles.

At Peterborough, 87 miles from Trenton, is a masonry lock and a concrete dam which maintain navigation through Little lake to lock No. 6 of the Peterborough-Lakefield division, a distance of about three-quarters of a mile.

PETERBOROUGH-LAKEFIELD DIVISION.

Embracing that stretch of river and canal navigation from Little lake at Peterborough to Lakefield, 11.00 miles.

Construction completed and canal in operation with a minimum depth of 6 feet for navigation.

From Peterborough to Lakefield, navigation is maintained on the Otonabee river by a series of concrete locks and timber dams as follows:—

Leaving Little Lake through lock No. 6, in a distance of about half a mile, the hydraulic lift lock is reached, where there is a lift of 65 feet into a reach which extends to lock No. 5, about

Trent Canal—Lakefield.

five miles from Peterborough, the last mile only of this reach being in the river; from here to Lakefield, locks 5, 4, 3, 2 and 1, with their res-

Trent Canal—Rice Lake.

pective dams, give navigation to Lakefield, about ten miles from Peterborough, or 97 from Trenton, and thence on five miles further to Young's Point.

Kawartha Lakes Division.

Embraces that stretch of lake and river navigation from Lakefield to Balsam lake—64 miles.

Navigable with a minimum depth of 6 feet. Also in this division, may be included the Lindsay branch which embraces the Scugog lake and river from main channel on Sturgeon lake to Port Perry, the distance being 36 miles, not included in the total of 64 miles, above mentioned. A new lock and dam at Lindsay on this branch has recently been built.

At Young's Point, a masonry lock and timber dam maintain navigation through Clear and Stony lakes to Burleigh, a distance of about nine miles.

At Burleigh, a masonry lock of two lifts and timber dam maintain navigation through Lovesick lake, about two miles, to Lovesick. A new concrete dam is under construction at Burleigh.

At Lovesick, a masonry lock and timber dam maintain navigation through Deer bay for about five miles to Buckhorn.

At Buckhorn, a masonry lock and new concrete dam maintain navigation for about $16\frac{1}{2}$ miles through Buckhorn and Pigeon lakes to Bobcaygeon, 135 miles from Trenton.

At Bobcaygeon, a masonry lock and two dams one being recently rebuilt of concrete and the other a timber one, maintain navigation through Sturgeon lake and Fenelon river, a distance of about $14\frac{1}{2}$ miles to Fenelon Falls.

At Fenelon Falls is a short canal, a masonry lock of two lifts and a timber dam which maintain navigation across Cameron lakes to Rosedale, a distance of about $3\frac{1}{2}$ miles to a new concrete lock of the same dimensions as those of the Ontario-Rice Lake division.

At Rosedale, the new concrete lock and dam maintains navigation on Balsam lake, the summit level of the canal, which extends from Rosedale to the hydraulic lock at Kirkfield, a distance of twelve miles; half of this distance is through a canal connecting Balsam lake with the lock, which is about 165 miles from Trenton.

Simcoe-Balsam Lake Division.

Extends from Balsam lake to Gamebridge on Lake Simcoe—19 miles.

Construction completed and canal in operation with a minimum depth of 6 feet.

At the Kirkfield hydraulic lock is a drop of 50.44 feet from the summit level. From this point to Gamebridge on Lake Simcoe, 178 miles from Trenton, the route consists of canal and river reaches maintained by damming the Talbot river. There are five new concrete locks numbered 1, 2, 3, 4 and 5, with concrete dams at Nos. 1, 2 and 3.

HOLLAND RIVER DIVISION.

On Holland River Improvement, is a branch extending southwards from Lake Simcoe to Newmarket—12.3 miles.

Under construction to furnish 6 feet navigation.

Superintending engineer's report covers progress of construction.

The following is a list of locks, with their dimensions, in order of location, from Hastings to Gamebridge on Lake Simcoe.

	Length between Hollow Quoins.	Width	Depth on Sill.	Lift.
	Ft.	Ft.	Ft.	Ft.
1 Lock at Hastings	175	33	8 4in	9
1 " at Peterborough	134	33	6	9
1 " No. 6, Peterborough—Lake-Division	142	33	6	12
1 " at Peterborough, hydraulic lift lock No. 1	140	33	6	65
1 " No. 5, Peterborough—Lake-field Division	142	33	6	14
1 " No. 4, Peterborough—Lake-field Division	142	33	6	12
1 " No. 3, Peterborough—Lake-field Division	142	33	6	12
1 " No. 2, Peterborough—Lake-field Division	142	33	6	10
1 " No. 1, Peterborough—Lake-field Division	142	33	6	16
1 " at Young's Point	134	33	6	6
2 " at Burleigh, each 11½ feet: Upper	134	33	6	23
Lower	150			
1 " at Lovesick	134	33	6	4
1 " at Buckhorn	134	33	6	9
1 " at Bobcaygeon	134	33	6	7
2 " at Fenelon Falls, each 12 feet: Upper	134	23	6	24
Lower	150			
1 " at Rosedale	175	33	8 4in	4
1 " at Kirkfield, hydraulic lift lock No. 2	140	33	6	50. 44
1 " No. 1, Simcoe—Balsam Lake Divison	142	33	6	21
1 " No. 2, Simcoe—Balsam Lake Division	142	33	6	14
1 " No. 3, Simcoe—Balsam Lake Division	142	33	6	14
1 " No. 4, Simcoe—Balsam Lake Division	142	33	6	14
1 " No. 5, Simcoe—Balsam Lake Division	142	33	6	11
24				
1 " at Lindsay Scugog Branch ..	142	33	6	6.5

TRAFFIC.

The total traffic through the several canals of the Dominion for the season of 1910 amounted to 42,990,608 tons, an increase of 9,269,860 tons compared with the previous year. 320,574 passengers were carried, an increase of 43,352.

The following features of the principal canal traffic during the season of 1910, will be of interest:—

On the Welland canal, 2,326,290 tons of freight were moved, an increase of 300,339 tons. Of the total, 1,042,538 tons were agricultural products and 154,737 tons produce of the forest; of coal, 577,491 tons were carried; 2,281,519 tons were through freight, of which 1,557,283 tons passed eastward.

Of the through freight, Canadian vessels carried 1,503,476 tons, an increase of 255,782 tons, and United States vessels 778,043 tons, an increase of 49,697 tons.

The total through freight passed eastward and westward through this canal to United States ports was 485,499 tons, an increase of 40,080 tons compared with the year 1909.

The quantity of grain passed down the Welland and St. Lawrence canals to Montreal was 789,661 tons, an increase of 136,919 tons as compared with the previous year; no transhipments have been made at Odgensburg since 1903.

On the St. Lawrence canals 2,760,752 tons were moved, an increase of 350,123 tons, of which 1,916,733 tons were eastbound freight and 844,019 tons west bound freight; 930,851 tons were agricultural products; 759,052 tons coal; and 560,328 tons forest products.

On the Ottawa river canals, the total quantity of freight moved was 385,261 tons, an increase of 48,322 tons, of which 268,199 tons were produce of the forest.

On the Chambly canal, 669,299 tons were moved, a decrease of 82,818 tons, of which 496,119 tons were produce of the forest and 99,485 tons of coal.

On the Rideau canal, 134,881 tons were carried an increase of 43,107 tons; 40,026 tons being produce of the forest, and 13,304 tons of coal.

On the St. Peter's canal 85,951 tons were carried, an increase of 6,101 tons; 42,350 tons were coal.

On the Murray canal, 177,941 tons passed, an increase of 75,650 tons.

On the Trent canal, 46,263 tons were moved, of which 35,849 tons were produce of the forest.

On the St. Andrew's lock on the Red River, Manitoba,the volume of business was 8,283 tons.

On the Sault Ste. Marie canal, the total movement of freight was 36,395,687 tons, being an increase of 5,534,442 tons. There were 7,972 passages of vessels, the number of lockages being 6,110. Of wheat, 68,396,300 bushels and of other grain 23,855,747 bushels were carried; 2,831,260 barrels of flour; 28,440,952 tons of iron ore; 4,109,565 tons of coal, and 44,646,650 feet, board measure, lumber.

NOTE.—The reports for 1911 have not yet been published.

Sault Ste. Marie, Ont.—The gateway of the Great Lakes.

SURVEYS OF GEORGIAN BAY CANAL.

In 1615, Samuel de Champlain, a Frenchman, ascended the Ottawa river from the present location of Montreal city and then by Lake Nipissing and French river to Lake Huron. For many years this route was followed by explorers from the St. Lawrence river. Canoes were used to convey furs and peltries along the course pursued by these early voyageurs.

Early survey.

Surveys were made in 1857, for a projected canal between Montreal and Georgian bay, and estimates made of the cost, but nothing further than the survey had been accomplished until 1904, when another survey was begun. This latter survey has been very complete and from the report and plans published by the Public Works Department of the Dominion, the following extracts have been taken, showing the conclusions at which the engineers arrived.

That a 22-foot waterway for the largest lake boats (600 feet x 60 feet x 20 feet draft) can be established for one hundred million dollars ($100,000,000) in ten years, and that the annual maintenance will be approximately $900,000, including the operation of storage reservoirs for the better distribution of the flood waters of the Ottawa river.

2nd. That the distance from Montreal harbour to French river village on the Georgian Bay is 440 miles. That the rise from Montreal harbour to the summit of 659 feet can be overcome by 23 locks, ranging fron 5 feet to 50 feet in lift, and that the descent of 98 feet from the summit to Georgian Bay can be made by four locks, ranging from 21 feet to 29 feet in height of lift,—27 locks in all, connecting 23 navigable pool levels of various lengths.

3rd. That sufficient water may be stored within its own and adjacent watersheds to operate a summit level above lake Nipissing. That to use the Lake Nipissing level as a summit would increase the cost at least $10,000,000 and introduce 12 additional miles of canal cutting. That the natural low water flow throughout the Ottawa and French rivers, is more than ample to meet all the requirements. That the spring flood in the Ottawa river can be restrained by

storage throughout its watershed so that, under extreme conditions, the reaches will not overflow; currents therein will not be over three miles per hour, and locks will be workable, that is to say, practically slack water navigation will obtain.

4th. That ordinary lift locks are best suited to the conditions found. That their minimum length should be 650 feet between inside gates, with 65 feet clear width, and 22 feet clear depth throughout.

That the gates should be of steel, and for safety there would be 2 pairs of upper gates and 2 pairs of lower gates with additional lower unwatering gates, if necessary.

That the locks should be constructed of concrete with long approach piers of continuous cribwork at each end. That all locks will be on secure rock foundation.

5th. That there will be 18 main dams required, some of considerable size, all being on secure rock foundation.

That regulation by stop-log sluices is amply efficient in most of the cases encountered, and "stoney" sluices and overflow regulation are adapted to the remaining reaches.

6th. That excavated channels with sides showing above water should have a minimum width of 200 feet at bottom, and submerged channels a minimum width of 300 feet at bottom, with marking piers at intervals, and that the minimum depth throughout should be 22 feet. That the project presented contemplates:

28 miles of canal excavation.

66 miles of channel dredging.

346 miles of river and lake with a width of 300 feet to a half mile.

Sault Ste. Marie, Ont.—Lake Superior Corporation—Cold storage yard, dock and coal-unloader. 650,000 tons of coal will be handled over this dock annually during navigation.

That there are 116 curves of which 77 are of about one mile radius, and the remaining 39 of about half that radius.

7th. That the probable time taken by a lake freight boat of 12-mile maximum speed, without delays at locks or in meeting other boats, from French River harbour to Montreal would be 70 hours. That the season of navigation will average 210 days from May to November.

8th. That the proposed reaches will be generally held at about the ordinary high water level of their vicinity, and much of the area to be flooded is now inundated each spring, so no extensive damage to the farming districts will occur.

9th. That with a storage system as planned, and the tributary basins thereto required for the navigation project, a reliable water-power supply is secured at various dams amounting to 1,000,000 horse-power, which can be developed for about $50 per h.p.

10th. That an alternative route behind Montreal is entirely feasible and would cost $5,000,000 less than the front or St. Lawrence river route; the time of transit by the back route being less than one hour longer than by the front of Montreal, and having one lockage less.

11th. That locks 800 feet long and 75 feet wide would increase the total cost by $5,000,000. That building all locks to a depth of 24 feet so reaches might afterwards be deepened, would cost another $6,000,000. That a depth of 25 feet along the route behind Montreal for 16 miles to Sault au Recollet would cost $7,250,000, nearly $2,000,000 more than the 22 feet depth for the same distance. That increased depth up to 26 feet can be secured temporarily by filling the reaches above ordinary working level,

Fort William, Ont,—A busy port on the Great Lakes.

and in the case of emergency will pass boats of 24 to 25 foot draft, if the terminal locks and those into Lake Nipissing are given a 26-foot depth, and slight additions made to the overflow dams.

12th. That no international waters are affected.

The construction of this canal, however, is in prospective, and no definite arrangements have been yet made public respecting the intention of the Government. A map has been published in the report, by which it will be seen that a straight line drawn from Montreal westward and following the Ottawa river and Lake Nipissing will pass through the vicinity of Sault Ste. Marie giving the most direct and shortest route to Lake Superior. The saving on this route between Lake Superior and Montreal, by a steam propelled vessel, compared with the present route, would be over 500 miles.

Fort William, Ont—Another view, showing the docking facilities.

LENGTH, BREADTH, AREA AND ELEVATION OF THE GREAT LAKES.

These great bodies of water, almost in the heart of the continent, afford the United States and Canada highways for conveying commodities east and west during the season of navigation of exceptional advantage. The navigation of them, as shown in the foregoing descriptions, cannot fail to suggest their value in cheapening freight charges as compared with railways. The comparison between the rates of water-borne cargo and freight on railways has been variously estimated, but a careful examination of the question has shown that freight can be carried by water for about one sixth of the cost per mile charged upon railways. Calculations, however, by any process of figuring would be

out of place here, and again, one element or factor may be left out by one calculator that would be included by another. For instance, time may be of importance in the delivery of articles, particularly in regard to perishable goods. Interest on money used in transportation, on account of the greater length of time necessary to convey freight by water, per mile, than by railway, enters into a minute and elaborate calculation. Generally speaking, however, it can be said that freight carried by water will ultimately effect the prices of articles favourably to the consumer.

Lake Superior and other lakes.

The greatest length of Lake Superior is 354 miles; breadth 162 miles; area 31,800 square miles; mean depth, 688 feet, greatest depth 1,008 feet; elevation above tidal waters at New York 602 feet. Lake Michigan, U.S., greatest length 316 miles; breadth 118 miles; area 22,400 square miles; depth 690 feet; greatest depth 870 feet; elevation 581 above tide water. Lake Huron, greatest length 207 miles; greatest breadth 101 miles; area 23,200 square miles; mean depth 700 feet; its greatest depth 750; elevation 501 feet above tidal waters. Lake Erie, greatest length 239 miles; greatest breadth 59 miles; area 10,000 square miles; mean depth 84 feet; greatest depth 210 feet; elevation 572 feet above tidal water at NewYork. Lake Ontario, greatest length 193 miles; breadth 53 miles; mean depth 500; greatest depth 738 feet; area 7,260 square miles; elevation 246 feet.

Distance from Port Arthur and Fort William to Liverpool, G.B.

Some features of the route from the head of lake navigation to Liverpool, Great Britain, are of great interest to shippers of grain by water. From Fort William and Port Arthur, the two principal ports at the head of Lake Superior and the gateway of the Northwest provinces, to Montreal the head of ocean navigation, the distance is 1,500 miles, from Montreal to Quebec 160 miles. Between Montreal and Quebec, is the important port of Three Rivers, the head of tidal waters on the St. Lawrence river. From Quebec to the Strait of Belle Isle, the distance is 573 miles. By this it will be seen that the distance from the head of lake navigation by lakes, canals and the St. Clair, Detroit and St. Lawrence rivers to the entrance of the Strait of Belle Isle, where vessels enter the Atlantic ocean, is 2,233 miles. The total distance, therefore, from Fort William and Port Arthur to Liverpool by Canadian waters is 3,835 miles. This might have been stated in one line, but the other facts included are of sufficient importance to mention them.

It is also important to note, in connection with grain and flour shipments from lake ports on either side of Lake Superior or Lake Michigan, that the route described is about 450 miles shorter than any other route by which grain is shipped.

Transferring Cargo to Ocean-going Vessels at Montreal and Quebec.

Transferring grain to ocean-going vessels at Montreal has for many years been done by floating or stationary elevators. The conveyer system, established by the Harbour Commissioners and Grand Trunk Railway, by use of belts in galleries from the elevators to the ships lying in their berths, has been in use for several years. This system has been found effective in saving time by enabling vessels to discharge overseas cargo from one compartment and take in grain in another at the same time. Grain is also transferred at Quebec to ocean-going vessels. Vessels drop down stream late in the Fall

Canadian Pacific Ry. Co.—S.S. Assiniboia a greyhound of the Great Lakes.

S. S. Laurentic docking, Montreal.

Montreal Harbour Commission—Two wheat-carrying steamers are being loaded simultaneously from one elevator.

from Montreal to finish loading at Quebec; independent of this, barges unload grain at this port.

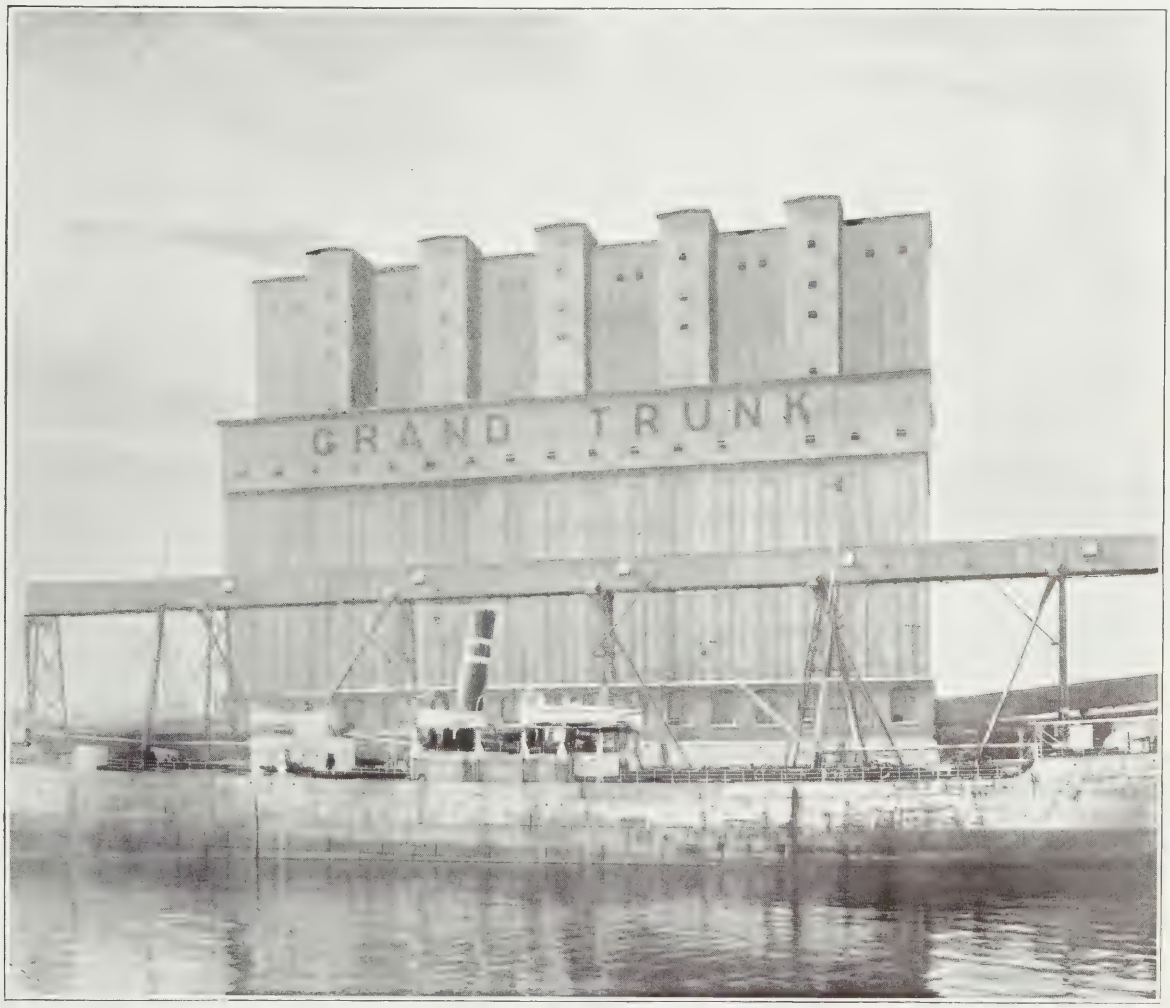
Vast sums of money have been spent, on both sides of the International boundary line, in making artificial harbours by the construction of piers, breakwaters and dredging of basins. Natural harbours and the channels leading to them, have been improved. In a statement published by the Department of Railways and Canals, in the Annual Report for the year 1911, it is shown that the sum of $128,087,241.91 has been expended in construction, equipment and enlargement of Canadian canals up to the present.

Total expenditure for Construction of Canals.

LENGTH OF COAST LINE OF GREAT LAKES.

The great length of coast line of the inland seas, as the Great Lakes are termed, suggests at once vast expenditure and difficult engineering work, in connection with improvements and aids to make navigation easy and safe. Trade and commerce and passenger traffic, between one port and another and across the Lakes, have become so important in carrying on the business of the country and in trade with the United States, that inland navigation yearly presents new problems for the Federal Government to consider.

The Canadian or north shore coast line of these lakes vary in countour; Lake Erie has but few



The Grand Trunk Elevator, Montreal.

Photo from Montreal Harbour Commission—S. S. Megantic opposite river end of Shed No. 9, just previous to her mooring.

indentations; the harbours are principally artificial and were costly and difficult of construction. The other lakes contain estuaries and indentations and are entered by numerous rivers. Harbours have been formed at the mouths of rivers which afford accommodation for loading and shelter in storms and gales. The Canadian coast line of Lake Ontario extends, approximately, a distance of 250 miles from end to end; of Lake Erie 290 miles; of Lake Huron including Georgian Bay 620 miles; and of Lake Superior 400 miles.

Length of Canadian Coast Line. Great Lakes.

Hydrographic surveys have been made by Great Britain, Canada and the United States. Valuable and reliable charts have been published containing indispensable information for mariners. Lights, buoys, fog alarms, life saving stations and other aids to navigation have been from time to time established. In connection with affording information to mariners, establishing aids and improvements generally and communication, the principle of international comity between the United States, Great Britain and Canada has been observed. Information is readily and cordially furnished between these countries, and the utmost has been done in this line to afford shipping and navigators every facility to pursue their dangerous calling.

It will be observed that much has been done, but much requires to be done in the way of developing inland navigation in combining, harmonizing and facilitating the transfer of freight between the waterways and railways, utilization of large but shallow streams, rivers, construction of dry docks, harbour equipment, mechanical appliances and facilities for loading and unloading vessels in ports. Canada, therefore, presents a large field for engineering and mechanical skill as well as the employment of labour, in carrying out the proposed improvements and work likely to arise as time advances and the money is available.

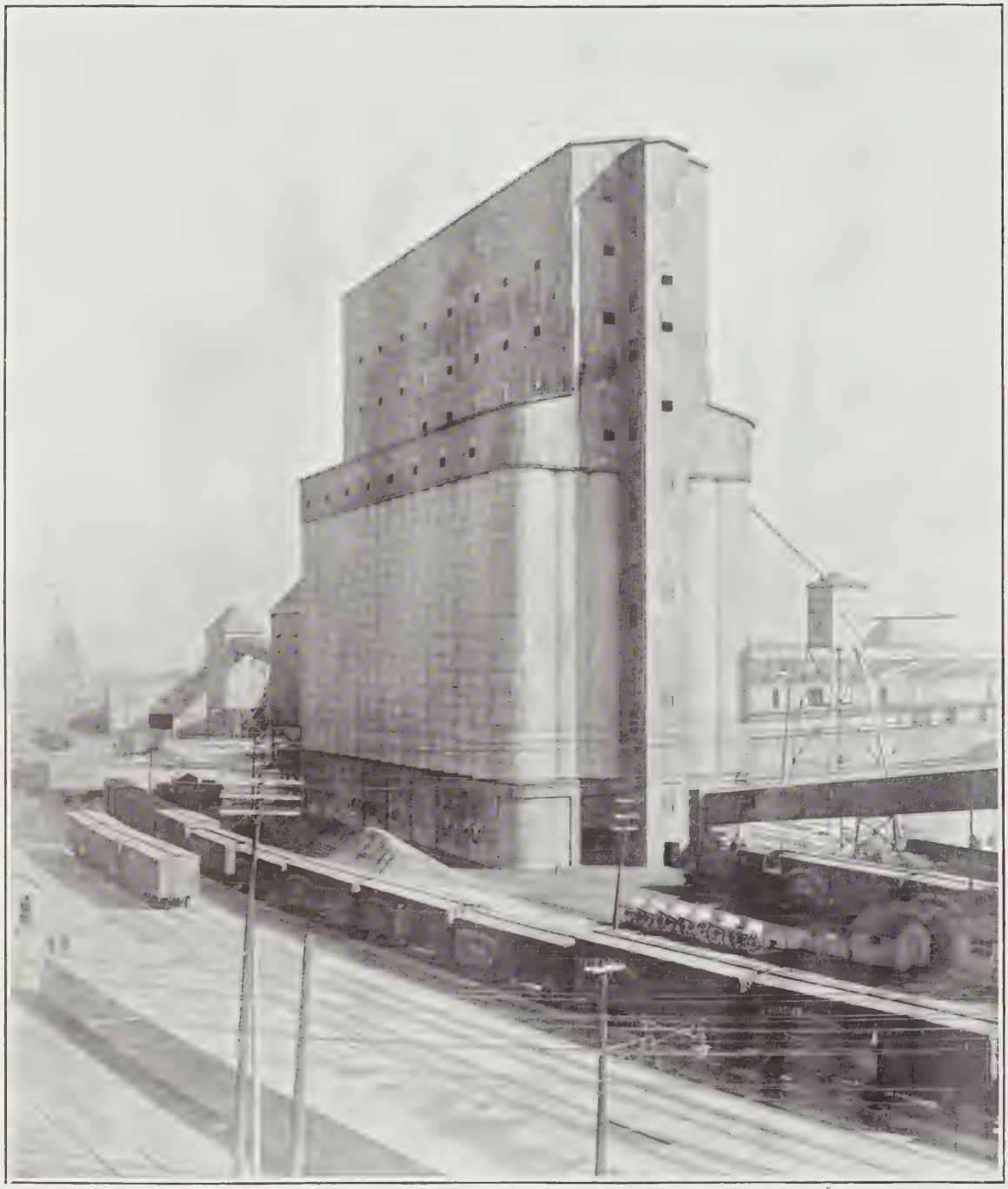
Space will not permit any description of minor waters in eastern nor central Ontario. It is sufficient to mention the fact that many rivers and lakes are made use of in local trade, lumber traffic and excursions, but the Ottawa river on account of its navigation and length is too important to omit.

From the report of the Georgian Bay Ship Canal Survey has been obtained the length of

Ottawa—The J. R. Booth Saw mills.

Ottawa River.

the Ottawa river and area of the basin it drains. From its source, which is almost directly north of the city of Ottawa, at the height of land which marks the commencement of the slope to Hudson bay, to its junction with the St. Lawrence river, is a distance of 750 miles. The Ottawa river drains a basin of 56,043 square miles. From a report of the Public Works Department, the navigable length of the river has been obtained. The Upper Ottawa, that is above Ottawa city, can be navigated on various parts to the mouth of the Mattawan river, a total distance of 192 miles. From Ottawa to the Joachim Rapids, a distance of 120 miles, steamers of 6 feet draught can navigate the various sections. From Joachim Rapids to the mouth of the Mattawan river, a distance of 50 miles may be navigated by steamers of $3\frac{1}{2}$ feet draught



Montreal Harbour Commissioners' Elevator No. 1.

at low water. It should, however, be pointed out that owing to rapids and falls a clear run cannot be made from Ottawa to the Mattawan river.

The Lower Ottawa is 120 miles in length and many steamers are employed carrying freight and passengers from Ottawa to Montreal and intermediate points. The canals, which enable steamers to pass between the two ports mentioned, are included in the description of canals furnished by the Railways and Canals Department under the heading of Canals.

Three large bodies of water, that are enlargements of this river, are Lake Temiscaming, Lake Deschenes and Lake of The Two Mountains. These expanses are beautiful lakes much used as pleasure resorts and for general navigation.

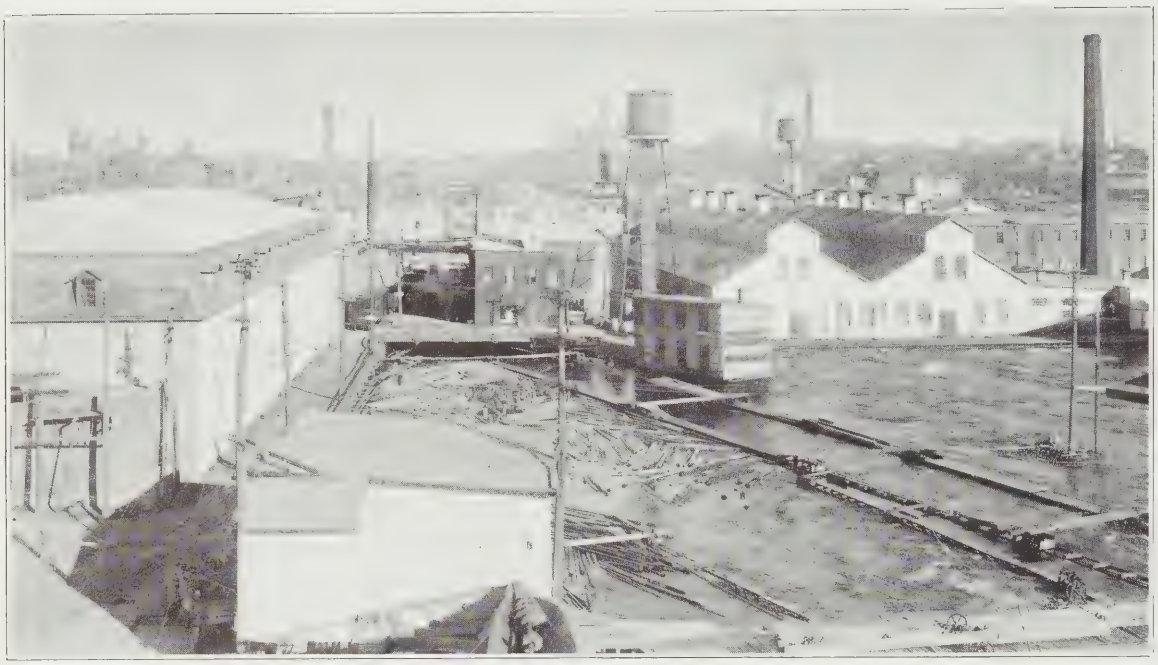
MINOR NAVIGABLE WATERS IN WESTERN ONTARIO.

From a recent report by Mr. George Phillips, steamboat inspector for the division of Western Ontario, Manitoba, Saskatchewan, Alberta and Keewatin, has been obtained the present extent of navigation on which steamers ply, at the minimum depth of water. The water is much deeper at certain seasons.

Lake Nipigon.

Lake Nipigon is north of Fort William and lies between the shores of Lake Superior and the Grand Trunk Pacific Railway. The lake is navigable from the north end, where it connects with the railway, for a distance of 70 miles for vessels of 10 feet draught. At present the lake and surroundings are preserved by the

Montreal Harbour Commission—Freight shed.



Hull—This view shews a portion of the E. B. Eddy Ltd. mills.

Chateau Frontenac and Citadel, Quebec.

Ontario Government as a forest, fishing and game preserve. It is justly famed for the variety and quantity of fish within its waters and streams discharging into it. Sportsmen visit the lake for hunting and fishing at the proper seasons. Three steamers are engaged in carrying passengers and freight from one point to another, situated on its banks.

Lake Helen.

Lake Helen is still further east and is navigable from Nipigon, a station on the Grand Trunk Pacific, in a northerly direction for 15 miles for vessels of a draught of 6 feet and for 6 miles up the Nipigon river. One steamer plys on the river, carrying passengers and freight.

Lake Sturgeon.

Lake Sturgeon is 300 miles east of Winnipeg, in western Ontario. It is navigable, from where it connects with the railway, in a south-easterly direction for a distance of 40 miles for steamers of 6 feet draught; there are four steamers plying on the lake. Minerals are abundant in the vicinity.

Lake Suel.

Lake or Lac Suel is also connected with the Grand Trunk Pacific Railway at a point about 300 miles east of Winnipeg. It is navigable in an easterly and westerly direction for 180 miles, by steamers of a draught of 8 feet. One steamer is at present engaged in carrying passengers and freight on its waters. The surrounding country is heavily wooded with a fine growth of timber forest.

Lake Manitou.

This lake is seven miles south of Lake Wabigoon. The two lakes are connected by a seven mile portage. Manitou lake is navigable for 40 miles in an easterly direction, by steamers of 6 feet draught. The navigation of the lake is important as it is in a mining district. Two small steamers carry freight and passengers from one point to another.

Lake Wabigoon.

Lake Wabigoon lies near a section of the Canadian Pacific Railway, 250 miles east of Winnipeg. It is navigable from Dryden in a southerly direction for 50 miles by vessels of a draught of 7 feet. Connection is made with Lake Manitou by portage. Five steamers are engaged on Lake Wabigoon in the frieght, lumber and fishing industries. The lake is an important stretch of navigation and the centre of a rich mineral district.

Eagle Lake.

Eagle Lake is connected with the main line of the Canadian Pacific Railway, 188 miles east of Winnipeg. It is navigable from Vermillion bay in a southerly direction, for a distance of 60 miles by steamers of a draught of 7 feet. The lake has connection with a number of small water stretches and navigation is important. Three steamboats navigate the lake.

Lake of the Woods.

Lake of the Woods is connected with the Canadian Pacific Railway at Kenora, in Ontario, and the Canadian Northern Railway on the south side at Warroad, Minnesota. The Rainy river discharges into this lake. It is navigable for a distance of 80 miles from Kenora to the mouth of Rainy river by vessels drawing 9 feet of water. Twenty-two steamers are employed on this lake, the largest at present being 472 tons. The lake is famed for the thousands of islands within its bounds, and for its mineral deposits and mines in operation. It has become the greatest summer resort in western Canada. The Winnipeg river is one of its tributaries.

Rainy Lake.

Rainy Lake is another sheet of water fast becoming a favourite summer resort. The Canadian Northern Railway runs along its banks for some distance, and part of the roadbed has been formed by connecting some of the islands by fillings. It is navigable from Fort Francis, Ontario, in a south-easterly direction for 75 miles for steamboats of 7 feet draught.

The lakes above described are within the boundary lines of the province of Ontario, and complete the comparatively new waters opened to navigation within recent years.

Lakes in Manitoba.

Lake Winnipeg.

Lake Winnipeg is a large body of water; it is properly included in the Great Lakes of Canada. It is navigable from the mouth of Red River at the south end to Nelson river at the north end, a distance of 300 miles, by steamers of a draught of 10 feet. Since the

completion of the locks at St. Andrews, 40 miles of navigation have been added, enabling steamboats to pass up the Red river to Winnipeg. The traffic on the lake is considerable, due to the extensive following of fishing operations. The Dominion Government has established two fish hatcheries near the lake. Dredging is now progressing for improvements at Red river and other points. Twenty-two steamers navigate the lake in different directions.

Lake Manitoba.

Lake Manitoba is connected at its southern end with the Canadian Pacific and Canadian Northern Railways at Oak Point and Totogan. It is navigable from these points northward to Gypsumville, a distance of 125 miles, by steamers drawing $5\frac{1}{2}$ feet. Dredging is being carried on to improve small harbours to a depth that will accomodate vessels drawing $4\frac{1}{2}$ feet. There are now five steamers navigating the lake, engaged in carrying lumber and gypsum.

Threshing scene, Manitoba.

The surrounding country is agricultural, and when settled the navigation on this lake will be of considerable importance.

Lake Winnipegosis.

Lake Winnipegosis is connected at the southern end with the Canadian Northern Railway at Winnipegosis; it is navigable from this point in a northerly direction for 120 miles for vessels with a draught of 7 feet. There are six steamboats on this lake engaged in fishing and the lumber trade. This lake is surrounded by a timber country and some good agricultural land. The white fish, trout and pickerel caught in its waters, are superior in quality. Artificial propagation is carried on by means of a fish hatchery.

LAKES OF SASKATCHEWAN.

Last Mountain Lake.

Last Mountain Lake is connected with the Canadian Northern and Canadian Pacific Railways at the southern end of the lake at Craven. It is navigable from this point for 70 miles in a northerly direction by vessels of a draught of 7 feet. The Public Works Department of Canada has a dredge at work improving harbours on the lake. The lake is surrounded by a rich prairie country. When this country is settled navigation is more than likely to become important. The locality is fast becoming a summer resort of the inhabitants of Saskatchewan, who find fish abundant in its waters.

Threshing scene, Portage la Prairie, Man.

Lake Athabaska.

Lake Athabaska is connected at the southwest corner with the Athabaska river, and at the northwest corner with the Peace river and the Slave river, at Fort Chipewyan. This is a deep water lake, and is now navigated from Fort Chipewyan to Fond du Lac, a distance of 130 miles by steamboats drawing 7 feet of water, but much larger and deeper draught boats might be successfully used. This lake is on the route to the Mackenzie river country and forms an important section for navigation to the

northern country. Its tributaries are the Athabaska, Peace and Slave rivers. Light draught river boats can run from Fort Chipewyan to Fort McMurray on the Athabaska river 187 miles to the Chutes on the Peace river, 173 miles, and to Fort Smith on the Slave river, 188 miles. Trout, white fish and pickerel abound in the waters of Lake Athabaska.

LAKES OF ALBERTA.

Lake Athabaska described above is partly in Alberta. Lesser Slave Lake is 250 miles north of Edmonton, and forms part of the route to the Peace river. Railway connection has not yet been established with the lake, but it is probable that it will be at no distant time, as the country surrounding it is being rapidly settled in sections of good farming land found there. The lake is navigable for a distance of 70 miles, its full length. One freight and passenger steamboat plys on its waters and runs 110 miles down the Lesser Slave river.

Lesser Slave Lake.

LAKE IN MACKENZIE TERRITORY.

Great Slave Lake is connected on the south side with the Slave river and at the northwest part with the Mackenzie river. The lake is deep, with only a few known indentations or natural harbours. River steamboats, drawing six feet of water, run from the Slave river to the Mackenzie, a distance of 100 miles and to Fort Ray, a distance of 130 miles. Boats also run from Fort Resolution on the lake to Fort Smith on the Slave river, and to the mouth of the Mackenzie river, a distance of 1,105 miles. Larger and deeper draught steamers might successfully operate on these waters. Great Slave lake, like the other northern lakes, contains white fish, trout and pickerel in immense numbers.

Great Slave Lake.

C. N. Ry.—Rainy River district, Moose swimming.

NAVIGABLE RIVERS IN WESTERN ONTARIO, MANITOBA, SASKATCHEWAN, ALBERTA AND MACKENZIE TERRITORY.

Many shallow rivers and streams are found in western Ontario that discharge into Georgian Bay and Lake Superior and smaller lakes north of the Great Lakes, but in a country where large rivers are numerous, small rivers are important only as lumber streams, but are not included in a publication intended to describe the main waterways only. The smaller streams are principally used for floating logs, intended for the manufacture of lumber at sawmills located on the shores and banks of larger bodies of water.

Rainy river in Western Ontario forms a stretch of navigation for light draught river boats from Lake of the Woods to Fort Francis for a distance of 90 miles. This river forms a very important link of navigation on the route between Kenora and Fort Francis. Three steamers are engaged on it in regular traffic.

Rainy River.

Red river, in Manitoba, is navigable from its mouth in Lake Winnipeg to Winnipeg city, a distance of 45 miles, by steamers of 10 feet draught. It is also navigable from Winnipeg by stern wheel steamers of 2. feet draught, to Grand Forks in the State of North Dakota. Three passenger steamers ply from Winnipeg to the Lake, the largest being a steamer of 883 tons.

Red River.

The Saskatchewan river is navigable from its mouth, at the north end of Lake Winnipeg, to Prince Albert, by steamers of a draught of three feet, a distance of 700 miles. There are nine steamers engaged in general traffic on this stretch, the largest of which is a vessel of 250 tons. The Saskatchewan is also navigable from Prince Albert to Brazeau river, a distance of 800 miles, by steamboats drawing 22 inches of water. There are three

Saskatchewan River.

Canadian Northern Ry.—Fenton Bridge, across Saskatchewan river.

Canadian Northern Railway Co.—Bridge at North Battleford.

steamers on this part of the river, engaged in freighting, towing and passenger traffic, the largest being 300 tons.

Athabaska River.

The Athabaska river is navigable from its mouth, at Lake Athabaska, to Fort McMurray, a distance of 187 miles, also from Fort McMurray to Fort Smith on the Slave river, 303 miles by steam boats of a draught of three feet, and from Fort McMurray to the Chutes on the Peace river, a distance of 458 miles. Four steamers ply on this part of the river carrying passengers and freight; the largest is 360 tons.

The Athabaska river is also navigable from Grand Rapids to the Lesser Slave river for 250 miles, by steamboats of 23 inches draught. Three steamboats are engaged on this part of the river in passenger and freight traffic; the largest being 148 tons.

Lesser Slave River.

Lesser Slave river runs from Lesser Slave lake to the Athabaska river, a distance of 75 miles, but is navigable only for a distance of 40 miles from the lake, with a draught of 5 feet. One steamer is now employed on this stretch. The Department of Public Works of Canada is improving the river for navigation from the Athabaska river to Lesser Slave lake. Lesser Slave river is important as it is part of the only route now taken to the Peace river country.

Peace River.

Peace river is navigable from its mouth to the Chutes for 272 miles, by steamboats of three feet draught. All vessels plying on the Lower Athabaska river, Athabaska lake and the Upper Slave river run up this portion of the Peace river. It is also navigable from the Chutes, excepting for a two-mile

Canadian Northern Ry.—Entering the Rainy Lake district.

portage at the Chutes, to Hudson's Hope, by steamers drawing three feet, a distance of 660 miles. Three steamboats are now navigating it.

Peace river, rising in the Rocky Mountains, has cut its way deep into the prairie soil towards Lake Athabaska, its banks, therefore, although high are singularly free from rocky cliffs. Peace river district is very extensive and its settlement is exciting much attention. The river will no doubt become a great waterway to the far north.

Slave River.

Slave river is navigable from its head at Lake Athabaska to Smith Landing, a distance of 118 miles by steamboats of a draught of five feet. All vessels running on Lake Athabaska, the Lower Athabaska river, and Peace river, include in their trips Slave river. At Smith Landing a portage intervenes of 16 miles to Fort Smith. From this point, Slave river is navigable for 194 miles by steamers drawing six feet, for a distance of 194 miles. Six steamboats are engaged in freight and passenger traffic; they all traverse Great Slave lake and run down the Mackenzie river.

Mackenzie River.

This magnificent river is navigable from its head at Great Slave lake to its mouth, in the Arctic ocean, a distance of 1,025 miles, by steamers having a draught of six feet.

Steamboats now plying on the Mackenzie river, including the waterways already mentioned, have a free run of 1,309 miles. No doubt is entertained regarding the navigation of vessels with cargo drawing six feet of water, from Fort Smith on the Slave river and making connections with ships in the Arctic ocean.

In addition to the rivers now navigated, are certain large but well known rivers that have been used by surveyors, trappers and explorers for many years.

Nelson River.

Nelson river is in the territory lately added to Manitoba. It rises in a chain of small lakes which are part of the northern end of Lake Winnipeg. The river is approximately 300 miles in length and empties into Hudson Bay at Port Nelson. Norway House, a well known Hudson Bay station, is located near the northern end of Lake Winnipeg in the vicinity of the head of the river, and York Factory, another well known Hudson Bay station, is located near the mouth of the river on Hudson Bay. The river is fed by numerous streams and is not navigable its whole length, by steamers similar to those employed on other rivers.

Yellowknife River.

Yellowknife river, in Mackenzie Territory, takes its rise in Upper Carp lake and runs into Great Slave lake. Its length is approximately 105 miles, but falls and rapids form obstructions to navigation in its course.

Coppermine River.

Coppermine river, also in Mackenzie Territory, rises in Point lake, is fed by many small streams and has a length between the lake and its mouth, in Coronation gulf, approximately of 500 miles. Two rapids and one fall prevent a free run from its source.

Churchill River.

Churchill river rises in the northern part of Saskatchewan, about 150 miles north of Prince Albert. The river flows in an easterly direction, and discharges at Port Churchill in Hudson Bay. Including the lakes the river is about 1000 miles in length. It is navigable in sections similar to other Canadian large rivers.

Albany River.

Albany river rises in Lake St. Joseph, in the northern part of the province of Ontario, and discharges into James Bay, the southern part of Hudson Bay. The river is approximately 600 miles in length.

Backs River.

Backs river rises in Artillery lake and runs to Franklin lake in the northern regions or Franklin Territory, a distance of over 600 miles.

The above condensed description of fresh water navigation from Thunder Bay, Lake Superior westward and northward to the Arctic ocean is given perhaps for the first time in a connected form. In it is embodied the length of navigable water stretches, the draught of steamboats now employed for the traffic, and will serve to show the means for transportation during settlement of the country along the rivers and surrounding the lakes. The immense possibilities of developing trade and commerce, in the products of the western pro-

vinces and northwest territories, are brought to the attention of all interested in Canada or in inland navigation itself, its improvement and development. Exception, however, is made in Coppermine, Churchill, Nelson, Albany and Backs rivers, where navigable portions are not referred to owing to lack of definite information as to the distances navigable.

No attempt has been made to describe the natural scenery nor the characteristic physical features, nor has mention been made of the resources of the country known to be very great along the rivers or surrounding the lakes. Navigation is the one main subject, while the purpose has been to afford correct information.

INLAND NAVIGATION IN BRITISH COLUMBIA.

Of the rivers and navigable waters of British Columbia, the following brief description is from the report of Steamboat Inspector, J. A. Thompson, who has had twenty years' service in inspection on the inland waters of the province.

Kootenay Lake.

Kootenay lake is 1,730 feet above sea level; it is formed by an expansion of the Kootenay river, which rises in the Rocky Mountains, about 20 miles south of Leanchoil on the Canadian Pacific Railway, in British Columbia. It flows southward into the State of Montana, turns gradually northward back into British Columbia; about 22 miles north of the boundary between British Columbia and Idaho, it suddenly expands and forms Kootenay leak. This lake trends practically north and south with an arm on the west side, which is the continuation of the Kootenay river that joins the Columbia river at Robson. The main lake is about 56 miles in length, with no obstruction of any kind to navigation, the west arm being about the middle of the main lake. It becomes shallow towards the north end. At the south end the Kootenay river is navigable to Bonners Ferry, in the State of Idaho, a distance of about 48 miles, the arm of the west side of the lake, going westward, trends southward before it ends, at the town of Nelson, a distance of 16 miles from the main lake.

Canadian Pacific Ry. Co—Fruit farming, Okanagan valley, BC.

The centre of traffic is from Nelson, where all the railways converge, to a number of landings on the west arm to Proctor, the terminus of the Canadian Pacific Railway at the east end of the arm, thence to Ainsworth, Kaslo and Lardo at the north end of the main lake. The traffic line continues from Nelson to Proctor, Pilot Bay, Crawford Bay and Kootenay Landing, at the south end of the lake, the terminus of the Crow's Nest Railway. From Kootenay Landing there is a large traffic with car barges carrying 18 cars, to Proctor. These cars are towed by powerful tugs. The passenger traffic between Nelson and the points mentioned is carried on by stern-wheel steamers, the "*Kuska-Nook*," 1008.19 tons gross, the "*Moyie*," 835 tons gross, the "*Kaslo*," 765 tons gross, the "*Kokanee*," 348 tons gross, and others; draught, 4.6 to 5 ft. The draught of the steamers from Nelson is limited by the narrows near Proctor where, in

Freight steamer on Lake Okanagan, B.C.

the season of low water, there is only about 8 feet depth of water, with the bottom covered with boulders. On the main lake there is a depth sufficient for any sized vessel.

The Kootenay river is also navigable from Canal Flats, at the source of the Columbia river, in East Kootenay district, to Jennings, Montana. Before the construction of the Crow's Nest Railway, steamers plied from Fort Steel, East Kootenay, to Jennings, Montana, about 60 miles.

Shuswap Lake.

Shuswap lake, Kamloops lake, Thompson and Spallumcheen rivers are so much part of each other, that they may be taken together. Shuswap is, properly speaking, the name of the district that extends from Sicamous to Kamloops, on the Canadian Pacific Railway. The Spallumcheen river, which rises in Mable lake, northeast of Okanagan lake, flows north, and is navigable from Enderby to Sicamous, 23 miles, where it joins Shuswap lake. This body of water is formed by several arms called Salmon arm east to west, Seymour arm north to south,

Summerland, B.C.—Apples, peaches and pears grow plentifully.

Shuswap lake proper, easterly to westerly. It is altogether a large body of water, and flowing westerly, it contracts and becomes what is known as the South Thompson river, again expands and becomes Kamloops lake.

The navigable distance from Enderby on the Spallumcheen to Savona, the westerly end of Kamloops lake, is 150 miles, but there is much more navigable water than this up the various arms. There was, during construction of the Canadian Pacific Railway, much traffic on this lake and the rivers. Now there are two passenger steamers of 192 tons gross and several tugs that are engaged in log towing. The passenger steamers ply between Sicamous and Kamloops, distance 100 miles, calling at the logging camps and several Indian villages.

North Thompson River.

The North Thompson, which debouches into the South Thompson at Kamloops coming from the north, has its rise up in the Cariboo country; it is a very swift river, shallow in places, but has been navigated for nearly 100 miles by good-sized steamers. There is practically, excepting excursions, no traffic on it now, but there will be as soon as the Canadian Northern Railway construction begins in that section.

First year oats, Coldstream Ranche Vernon, B.C., 120 bushels to the acre.

Adams River.

About 25 miles east of Kamloops, the Adams river flows into Little Shuswap lake. Adams lake is 9 miles up this river; it is 40 miles long. On it plies a steamer 331 tons gross, engaged in towing logs from the north end to the head of the river at the south end, where the logs are driven down to the Shuswap lake to the sawmill at Chase, on the opposite side of the lake.

Trout Lake.

Trout lake is a small lake in the mountains, lying in a north-westerly direction between the north end of Kootenay lake, distance 36 miles, and the north end of Arrow lake, distance 14 miles. The lake is 17 miles long, and like

all mountain lakes very deep. A small passenger steamer, 43 tons gross, plies between Gerrard, the end of the railway from Kootenay lake and Trout Lake City at the north end of the lake, where there is extensive mining carried on. She also, between times, tows a barge with concentrates from the mines to the railway at Gerrard.

Okanagan Lake.

Okanagan lake is a fine sheet of water, absolutely free from any obstruction to navigation, is of good depth throughout, and about 88 miles long. There is a large traffic, both freight and passenger, on the lake. The Canadian Pacific Railway Company has several fine steamers, of from 1078 to 554 gross tons, that ply between Okanagan Landing, the end of the railway, Okanagan ranch, and Kelowna, Peachland, Summerland and Penticton, the towns at the south end of the lake; also a powerful tug is used as there is much bulky agricultural produce that is carried on a barge. There are several smaller tugs belonging to the sawmills at the towns on the lake.

Slocan Lake.

Slocan lake, altitude 1,850 feet above sea level, is formed by a hollow in the mountains, midway between the valleys fronting Kootenay and Arrow lakes, north-west of Nelson on the west arm of Kootenay, about 26 miles in a straight line. This lake is over 1,700 feet deep, has warm springs and never freezes. The length of the lake is about 20 miles; there are several busy towns on it, as the mining is quite an industry. The passenger steamer is 605 tons gross; it plies between Slocan city at the south end and Roseberry at the north end of the lake. There is another steamer of 96 tons gross, also fitted as a passenger steamer, to relieve the larger boat, as occasion may require. She is used as a tug to tow the car barge, carrying 15 cars, from the railway at each end of the lake to make connection between the railway from Nelson to the short line that connects with Arrow lakes.

Hop garden, Coldstream ranche, Vernon, B.C.

Canadian Pacific Ry. Co.—Str. Bonnington, Arrow Lakes.

Arrow Lake and Columbia River.

The Arrow lakes are the most extensive area of navigation in the interior of British Columbia. They are formed by an expansion of the Columbia river from Arrowhead (to which there is a branch line from Revelstoke on the Canadian Pacific Railway, distance 28 miles) to Robson, where there is railway connection to Nelson on Kootenay lake, 28 miles, Rossland, 20 miles, and Greenwood, 100 miles. Arrow lakes, upper and lower, are about 125 miles long between Arrowhead and Robson. These are the points between which the steamers now ply. The lakes are navigable right up to Revelstoke. Before railway connections were made they used to go right up to Revelstoke on the north and to what was then known as Little Dalles, now Northport, in the State of Washington, on the Columbia river on the south, that is about 40 miles below West Robson, B.C., the present terminus.

The class of vessels that ply on the Arrow lakes in the passenger service are of the best of

their class: 1,117, 884, 829 tons. A new steel boat has been added named the "*Bonnington*," 2,000 tons, with several smaller passenger boats, besides powerful tugs to tow the 18-car barges between Nakusp and Arrowhead. The large passenger steamers are all sternwheel boats, as the Narrows between the upper and lower lakes get very shallow and crooked during the season of low water. 'The ice forms in the winter in the narrows, but they are kept open by an ice-breaker barge heavily armoured, which the up-

1500 salmon fishing boats at work, Steveston, B.C., Mouth Fraser river.

going steamer shoves before her, leaving the barge above the narrows where it is picked up by the down-going steamer, which also shoves it ahead of her and leaves it below the narrows. A channel is thus kept open all the winter, and there is no interruption to navigation.

The Columbia river, above Arrowhead at the north end of Arrow lakes, is navigable to La Porte, which is 40 miles above Revelstoke, where navigation is stopped by the Death Rapids. There is a passenger steamer, 309 gross tons, plying from Revelstoke to La Porte in the summer season. She is a stern-wheel boat. It is very swift water; at one part the rise is 9 feet in three lengths of the boat, and requires good power to ascend; it is a most interesting trip. From La Porte navigation stops, the Columbia flowing round what is known as the "Big Bend," 190 miles between Revelstoke and Golden on the Canadian Pacific Railway, where navigation commences again. From Golden, a passenger steamer, 178 tons gross, plies on the Upper Columbia to Windermere, about 90 miles.

Fraser river, the lower part from New Westminster, properly belongs to the coast district. Going up the river it is navigable from New Westminster to Yale on the Canadian Pacific, that is 100 miles from the mouth of the river. There are a number of steamers 545 to 300 gross tons on this upper route, though they seldom go now beyond Chilliwack, 40 miles. The navigation stops at Yale, owing to rocks and canyons, for 240 miles, till Soda Creek is reached in the Cariboo district. From there steamers of 513 to 129 gross tons, ply between Soda Creek, Quesnel, and Fort George, a distance of 154 miles. There is navigation beyond Fort George, and as the Grand Trunk Pacific construction goes on, steamers will ply further to carry material and passengers.

Fraser River.

Grand Trunk Pacific Railway, Fort George, B.C., Fraser river.

PRINCIPAL HARBOURS IN ONTARIO.

Toronto Harbour, Ontario, is situated on the north shore of Lake Ontario, about 35 miles from its western end. The harbour is on the south side of the city, is in extent about two miles east and west and one and a quarter miles north and south, containing about two and a half square miles. Adjoining Toronto harbour, but separated therefrom by a strong dyke is Ashbridge's bay, containing an area of about one and a quarter square miles. The harbour of Toronto is perfectly landlocked, a

Toronto Harbour.

formation of sand, called the Island, extends the whole length of the southerly limit of Toronto bay. There are two entrances to the harbour; the west is called the Queen's wharf channel. The eastern entrance, which has been dredged and faced with piers having a width of 1,000 feet at the outer part of the channel, forms the chief entrance, and is called the eastern channel. The western channel has been deepened to 16 and 18 feet, width 400 feet between concrete piers. The harbour forms a perfect harbour of refuge and is accessible during a storm blowing from any direction, by one or other of its channels. The average depth of water in the harbour is about 20 feet, with good anchorage in parts of the bay, and 14 feet along the wharf frontage.

The face frontage of the wharfs measures about one mile, separated by slips of various widths; some of the wharfs extend out a distance of 500 feet from the shore. Twenty-five railway sidings run along the water front; twelve of these are placed on coal docks.

Toronto has water communication by daily lines of steamers with many ports on Lake Ontario and with ports east and west, by vessels that can use the canals with their depth of 14 feet. Railway communication is maintained daily with all towns and villages in Ontario through which lines run, and connections with all transcontinental railways running east and west and with United States railway lines. The lights are: Eastern entrance, front range, 100 feet from outer end of east pier latitude 43° 37′ 48″ longitude 79° 20′ 20″ back range, 2,400 feet from front light with fog alarm; Western entrance, Gibraltar Point, light and fog alarm.

The harbour is under the control of Harbour Commissioners appointed by the Dominion Government, City Corporation and Board of Trade. Extensive improvements have been planned that will include new wharfs and sheds, deepening and extending the harbour and building of railway sidings to the ship's side.

Hamilton harbour is practically the whole of Burlington bay, in the extreme west end of Lake

Canadian Westinghouse Co. Ltd.—Works at Hamilton, Ont.

Hamilton Harbour. Ontario. The harbour is approximately six miles long by one mile wide. It is land-locked and anchorage is good in 50 feet of water with mud bottom. Burlington beach, a narrow neck of sand varying in width from 250 to 1,000 feet, separates the bay from the lake, through which the entrance from the lake to the harbour has been cut, and piers built on each side; the north pier being about 2,305 feet and the south pier 2,721 feet long, the width between varying from 174 feet at the outer to 103 feet at the inner end. There is a shoal in the harbour off the wharfs, but it is marked by buoys.

There are six wharfs in this harbour, with water from 12 to 18 feet deep. Sheds and railway sidings afford accommodation for handling freight.

Kingston Harbour. Kingston harbour is situated on the St. Lawrence river, at the northeastern extremity of Lake Ontario. The Cataraqui river empties into the St. Lawrence river at Kingston, and the mouth of it forms part of the harbour above the bridge. The extent of the harbour from Portsmouth on the west to Bell island on the eastern side, is about $3\frac{3}{4}$ miles, and the depth of water varies from about 12 to 20 feet at the outer ends of the wharfs, to 40 feet in places opposite the city in the St. Lawrence river.

There are eighteen wharfs in this harbour and two small docks for repairing vessels. Four grain elevators are conveniently located for shipping. The lights are one in the City Hall tower, latitude 44° 13′ 50″ longitude, 76° 58′ 25″ and one about five miles west of the city. Acetylene buoys are placed between Kingston and Montreal.

Port Colborne Harbour. Port Colbourne harbour is situated near the eastern end of Lake Erie, at the entrance of the Welland canal. The harbour is formed by two piers or breakwaters, the west breakwater is 4,424 feet long, running north of west to the shore of the lake, the east pier or breakwater is 2,400 feet long, running north of east to the lake shore. The en-

Port Colborne, Ont.—Harbour and entrance.

trance is about 675 feet wide, but vessels are cautioned in the List of Lights to keep 100 feet from the end of the east pier, leaving a clear entrance of about 575 feet between the piers. The area protected by the breakwaters is about 70 acres, with a depth of 22 feet between the buoys placed to show the limits of the deepened part. In this area, on the western side, is the Government grain elevator, built on a dock 700 feet long, which, with a loading berth in the centre of 200 feet width, is 600 feet wide, giving a width on each side of the loading berth of 200 feet. On the westerly side of the elevator, is the unloading berth, with a depth of 22 feet to the limit of the deepened part. On the easterly side of the elevator dock, a continuous dock extends up to the Welland canal basin, with a depth of water alongside of 22 feet and 75 feet in width, but increasing in width to 100 feet, which is the width of the entrance to the canal basin. Outside of the deep cut of 22 feet, the water is 16 feet deep in the approach to the canal basin between a line of isolated cribs or blocks opposite the continuous dock.

The Department of Railways and Canals has a siding on the west side of the canal running to the elevator, open to any railway which chooses to connect with it. The Grand Trunk Railway has a siding along the east side of the canal basin and a grain elevator of small capacity for lighterage purposes. The Government elevator, belonging to the Railways and Canals Department, has four marine legs and a capacity of 70,000 bushels per hour, and a storage capacity of 800,000 bushels. On the east dock of the canal basin, are coal chutes for unloading and bunkering steamers.

The lights are: front light on the outer end of the western breakwater, in latitude, 42° 52′ 2″, longitude, 79° 15′ 13″ with a fog alarm building, and back light on the eastern side of the outer end of the eastern breakwater.

Windsor Harbour.

Windsor harbour, Ontario, is situated on the east side of the Detroit river, near the outlet of Lake St. Clair. The wharfs afford good accommodation, the water being from 4 to 4½ fathoms along the frontage. The Grand Trunk Railway Company, the Canadian Pacific Railway Company, and the Michigan Central Railway Company, have wharfs and sheds at this port. The Detroit, Belle Isle and Montreal Ferry Company also has a wharf with a depth of water of 20 feet. The ferry boats of the Company ply every few minutes between Windsor and Detroit.

Four railway companies have transfer boats running between Windsor and Detroit, and there are two passenger lines, one plying between Windsor and Detroit and the other between Walkerville and Detroit. The Michigan Central Railway has completed a tunnel under the river by which communication is maintained with Canada and the United States at that point. Windsor has communication with several lake and Detroit river ports by water, and with all parts of Canada and the United States by rail. Owing to its situation it is mainly a railway centre, but an immense tonnage from the upper lakes passes up and down the channel of the Detroit river close to the water front of the city.

Sarnia Harbour.

This harbour lies on the east bank of the river St. Clair, at the head of the river, where the waters of Lake Huron enter that river. The limits of the harbour include all the waters of the St. Clair river between the Canadian shore and the International Boundary in the middle of the stream, and extends from the head of the river at the outlet of Lake Huron to the foot of the river at the entrance of St. Clair flats, a distance of about two miles. These waters include the inlet known as Sarnia bay, where vessels make their winter quarters and rafts of timber are handled.

The harbour has several good wharfs and loading and unloading docks. The depth of water at the wharfs averages 20 feet. There is good anchorage in the harbour at 30 feet.

Point Edward Harbour.

This harbour may be considered a continuation of Sarnia harbour. The wharfs are continuous along the river for 3,000 feet, with an average depth of water of 22 feet. Railway sidings are laid on the ore docks and to the grain elevator. The machinery and appliances for loading and unloading are considered excellent. The port has railway communication with all ports of Ontario and the United States.

Goderich, Ont., Breakwater.

The lights are two range lights on the shore of Lake Huron, latitude, 43° 0″ 11″, longitude, 82° 24′ 49″ and the back light 579 feet S. 2½ W. from front light. The lights in one lead to the head of St. Clair river from Lake Huron and should be kept in one ahead until their alignment is intersected by the alignment of Fort Gratiot range, on the United States side of the river.

Goderich Harbour.

Goderich harbour is on the southeastern part of Lake Huron. The harbour has been formed by the construction of two long piers, one called the north pier and the other the south pier, running out into the lake, at the mouth of the Maitland river. The harbour inside the piers is a basin entirely surrounded by cribwork, faced with timber and decked with plank with mooring hooks and posts.

There are two railway sidings along the entire length of the south side dock, where merchandise and freight of all kinds are handled, and two grain elevators with a capacity of 500,000 and 200,000 respectively.

Opposite the ends of the entrance piers, is a breakwater for the purpose of breaking the sea and permitting vessels to enter between the north and south piers, in comparatively smooth water.

The lights are: the main light on a high bank at the south side of the entrance to the harbour in latitude 43° 44′ 33″ N., longitude 81° 43′ 34″ W.; the front range light is near the end of the north pier at the entrance, and back light on the edge of the western side of the harbour basin. An acetylene light has been placed on the western end of the new breakwater, built out in the lake, about one thousand feet from the outer end of the north pier. The fog alarm is on the town waterworks building. At the inner end of the south pier is a lifeboat station.

Georgian Bay Ports.

The most important harbours in Georgian Bay, called the Bay ports, are Wiarton, Owen Sound, Collingwood, Meaford, Midland and Depot Harbour.

Owen Sound harbour is situated at the bottom of Owen Sound bay. The bay is eight miles

Owen Sound Harbour.

wide at the entrance, gradually narrowing until the town is reached, twelve miles from the entrance. The bay is well sheltered; its shores can be approached with safety to within one-quarter of a mile from shore, except at Vails and Squaw points on the east side of the bay or sound. The anchorage is good in the bay, in 6 to 7 fathoms of water at certain points, with mud bottom.

The depth of water at the wharfs is 22 feet. Large steamers are engaged in freight and passenger traffic from this port to Lake Superior ports.

Collingwood Harbour.

Collingwood harbour is on the south side of Georgian bay, and is a capacious harbour for lake vessels, having good wharf accommodation of about 7,000 lineal feet and 22 feet of water in the ship channel, at the approach to the harbour, and inside the harbour.

The accommodation for docking vessels is superior to any port on the Canadian side of the Great Lakes, and the port has one of the most complete shipbuilding plants anywhere on the Great Lakes, for construction and repairs. Heavy castings and forgings are made and heavy boiler plate turned for boiler construction. Marine engines are constructed and steel, composite and wooden hulls of large sized vessels built. Steel grain barges of 400 feet and longer can be built and equipped with engines and boilers; some of the best passenger and freight steamers on the upper lakes have been built and equipped at this port. One dry dock, in active service, is 545 feet long and 75 feet wide, which will accommodate the largest vessels on the Canadian register on the lakes; a second dock is 400 feet long and 100 feet wide; a third dry dock is contemplated, also a landing slip 1,000 feet long for further mooring accomodation of vessels while undergoing repairs.

The harbour has been made by the construction of crib breakwaters. The ship channel has been dredged 220 feet wide in hard pan and rock, having 22 feet of water.

Midland Harbour.

Midland Harbour is in Midland bay, on the southeast side of Georgian bay. The entrance is between Midland point and Elimere point, a distance of $2\frac{1}{2}$ to 3 miles. Midland bay runs a distance of four miles from the turning point at which vessels come in line with the electric range lights, situated on a hill in the southwest part of the town. The harbour is spacious, with a depth of 25 to 100 feet of water for anchorage for large vessels, with the exception of Middle shoal, which has a depth of 12 feet only. This shoal is in the track of vessels from Midland point to the wharfs situated on the southeast side of the harbour, but there is ample depth of water on each side of the shoal. The east side of the shoal in the harbour has a depth of from 50 to 100 feet, with ample room, the west side of the shoal has a channel 24 feet deep, narrow, but without obstructions. Vessels are well sheltered at the wharfs, no storm interferes with loading or discharging, and many large steamers are put in winter quarters in this harbour.

Tiffin.

Tiffin, where the Grand Trunk Railway Company owns a large grain elevator of 2,000,000 bushels capacity, is part of the Midland harbour. Two other grain elevators are within Midland harbour with a capacity of 1,000,000 bushels each.

Victoria Harbour.

Victoria harbour has within the last two years been completely changed and improved. It is situated on an inlet at the eastern end of Georgian bay and is a well sheltered harbour, easily approached from the open bay. The Canadian Pacific Railway Company has constructed a large grain elevator with a capacity of 2,000,000 bushels at this point. A flour shed of large size belonging to the company, when completed will add much importance to the harbour. The company has made this place a terminal point on Georgian bay for its railway line. Steamers belonging to the company now engaged in traffic on Georgian bay and Lake Superior, will here load and discharge.

Depot Harbour.

Depot Harbour is situated on the north shore of Parry island, Georgian bay, 5 to $6\frac{1}{2}$ miles distant from Parry Sound harbour. The approximate extent of the harbour, used by vessels, is one and a half miles by one-quarter

Canadian Pacific Ry. Co.—Wharf, elevator and steamship at Owen Sound.

Depot Harbour, Ontario.

mile, and the depth of water for anchorage is 5 fathoms, with good holding clay bottom. The harbour is well sheltered from heavy seas and its approach well marked by acetylene buoys, port and starboard spar buoys, compressed gas light houses and beacons, for a distance of twenty miles out into the open Georgian bay. The harbour is a large grain and coal receiving port and is well equipped for transferring freight from vessels to cars.

Sault Ste. Marie Harbour.

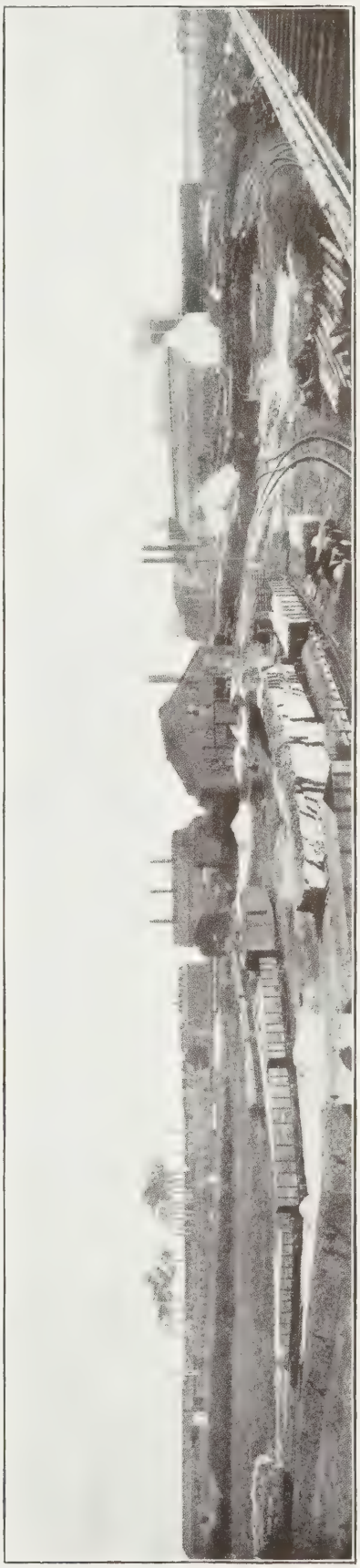
Sault Ste. Marie is on the St. Mary's river, about five miles east of the extreme easterly end of Lake Superior. The harbour of Sault Ste. Marie embraces the dredged approaches to the Sault Ste. Marie canal, and approaches to the different docks therefrom have been deepened. Safe anchorage can be found within the area mentioned, and towards the centre of the river outside the canal ranges, from a depth of 21 feet to 40 feet. The nature of the bottom of the river is sand and boulders overlying Potsdam sandstone.

Nine wharfs have been constructed in the harbour for handling general freight, coal and ore. The Algoma Steel Company's wharfs are used exclusively by that company in connection with their extensive works at this port.

Fort William Harbour.

Fort William is on the west side of Thunder bay, north shore of Lake Superior. The bay is a fine sheet of water, having a depth of $3\frac{1}{2}$ fathoms at the mouth of Kaministiquia river, where the harbour is situated, to 40 fathoms out in the bay. The Kaministiquia river has three channels emptying into the bay, at three distinct points, viz., the Fort William channel, McKeller's channel and Mission channel. The river has been made navigable for five miles up, and coal is conveyed to the unloading plant of the Canadian Northern Railway. Basins have been dredged for the accommodation of large steamers, which carry freight of all kinds and coal to this port and return with grain.

Large grain elevators have been erected at this port, one with a capacity of 7,000,000 bushels, said to be the largest in the world. Altogether the grain storage capacity at this port and Port Arthur adjoining, is over 30,000,000 bushels.



Sault Ste. Marie—Panoramic view of Western, or Iron and Steel groups of Industries, the Lake Superior Corporation.

Port Arthur Harbour.

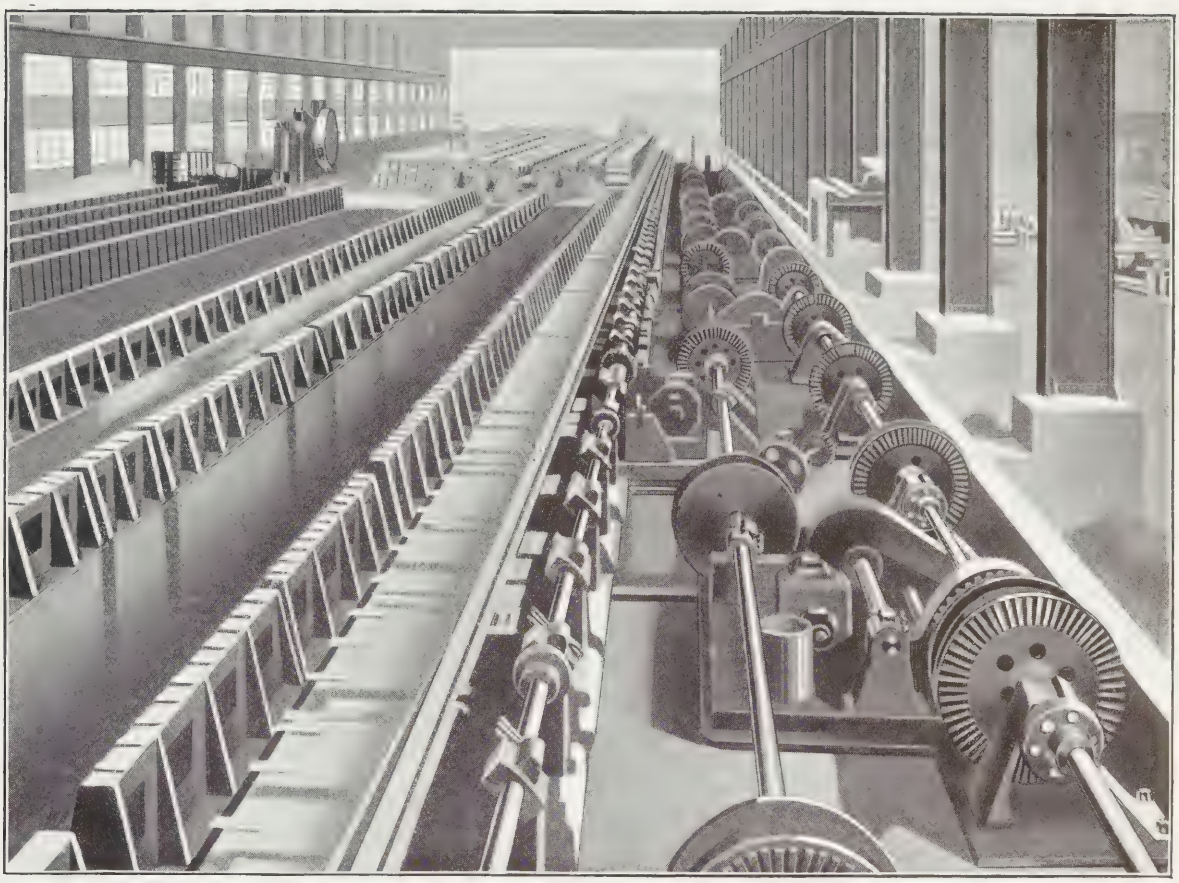
Port Arthur is situated on the northwest shore of Lake Superior, in Thunder bay. The inner harbour has been formed by the construction of a breakwater, with an entrance at each end and a main entrance between the northerly part of the breakwater and the southerly part. The measurement of the northerly part of the breakwater is 3,654 lineal feet, and the southerly part 1,507 feet. The main entrance between the piers is 366 feet wide, and the depth of water from 20 to 21 feet; 19 feet of water may be carried to the Canadian Northern Railway elevator wharf. The western entrance at the end of the breakwater is 1,800 feet wide, water varying from 12 to 18 feet deep; and the eastern entrance, at the other side of the harbour, at the end of the breakwater, is 250 feet wide and depth of water 17 feet. The water in the basin varies from 14 to 18 feet, but the channel from the main entrance to the Canadian Northern Railway elevator is dredged to 20½ feet to the Canadian Northern Railway wharf No. 1, and the Canadian Pacific Railway wharf to the same depth (20½).

The breakwater has made the inner harbour a safe one for mooring vessels at the wharfs.

Many other well known harbours are conveniently situated for traffic along the Great Lakes, but only the main harbours have been described. Detailed information respecting inland harbours will be found in the Port Directory published by the Department of Marine and Fisheries.

Under the headings of "Steamboat Lines" and "Railway Lines," in this book, will be found particulars of much interest to tourists, travellers, excursionists and others, who may desire

Sault Ste. Marie–Lake Superior Corporation—Exterior Merchant mill.



Sault Ste. Marie Lake Superior Corporation—Interior Merchant mill.

information respecting the means of conveyance from one point to another, and to summer resorts for recreation and sporting, on inland waters.

RIVERS IN THE PROVINCE OF QUEBEC.

St. Lawrence River.

The St. Lawrence is the main waterway in the province, but as not more than one third of the length of the river is within the Province of Quebec, it seems appropriate to trace it from its source to the mouth. Part of this waterway consists of the Great Lakes. The boundary line between the United States and Canada is an imaginary line, practically in the centre of the lakes, and if this line is followed, the course of the great St. Lawrence can easily be defined. The length of the river is 1,900 miles from the River St. Louis, in the State of Minnesota, to its mouth or where it enters the Gulf of St. Lawrence.

The boundary line begins at Victoria island, Thunder bay, Lake Superior, and runs north-easterly for a short distance, then south-easterly to the Sault Ste. Marie. From the Sault the line continues in a southerly direction through the centre of Lake Huron, then consecutively in the centre of the St. Clair river, Lake St. Clair and Detroit river and through the centre of Lake Erie and the Niagara river, and continues through the centre of Lake Ontario to Kingston at the outlet of the lake. The waters here become contracted, but the boundary continues to Cornwall, and from Cornwall the river is entirely within Canadian territory. The width of the river varies materially after it enters the

province of Quebec, notably at Lake St. Louis immediately above Montreal, and on Lake St. Peter between Montreal and Quebec. At its mouth where the river enters the Gulf, it is 23 nautical miles wide.

Tidal waters affect the river as far as Three Rivers, 82 miles below Montreal. Incidentally it may be mentioned that the harbour of Montreal is 18 miles in length, and what is termed the Port of Montreal extends from Montreal to Platon, a distance of 130 miles.

Saguenay River. The Saguenay river is navigable by large river steamers from Tadousac, on the north shore of the St. Lawrence river, to Chicoutimi, the head of navigation, a distance of 71½ miles, and by ocean-going vessels to St. Alphonse. It flows from Lake St. John by two discharges from the lake.

Lake St. John. Lake St. John is a body of water 30 miles long by 18 miles at its minimum width. Eight rivers flow into this lake, which in spring cause the overflowing of its banks.

Richelieu River. The Richelieu river is navigable from the St. Lawrence river to Lake Champlain, including canals, a distance of about 60 miles. Numerous rivers discharging into the St. Lawrence are navigable for a short distance from the main river.

NEW BRUNSWICK RIVERS.

The St. John river is 500 miles in length from its source, in the State of Maine, to St. John, where it discharges into the har-

Fort William—The Kaministiqua river.

Fort William, Ont.

St. John River.

bour of St. John on the Bay of Fundy. It is navigable in three sections. The first section is from the mouth of the St. Francis river, where it first touches Canadian territory, to Grand Falls, a distance of 75 miles; the second section is from Grand Falls to Fredericton, 140 miles, and the third to St. John, a distance of 80 miles. The influence of the tide is felt as far as Chapel Bar, 90 miles from the mouth of the river.

Several lakes and rivers empty into the St. John river. Grand Lake is about 30 miles long and is from three to six miles in breadth. Its outlet is about 30 miles below Fredericton at what is called the Jemseg, a narrow, deep channel. Salmon river, which falls into the head of the lake, is a good sized stream, rising in the same highlands as the Richibucto river that flows into the Gulf of St. Lawrence.

The Washedemoak flows into the St. John river about 36 miles below Fredericton. This river has a course of between 60 and 70 miles.

Extensive improvements have been made on the St. John river by the Government of New Brunswick and by the Federal Government, covering a period of many years. An International Commission is now engaged in an hydraulic investigation of the river, its tributaries, lakes and watersheds to determine the possibilities and effect of creating storage by dams, and otherwise improving the river.

The St. John river is famed for its beauty and on this account offers exceptional attractions to tourists, who find steamers plying be-

tween St. John and Fredericton, with excellent accommodation.

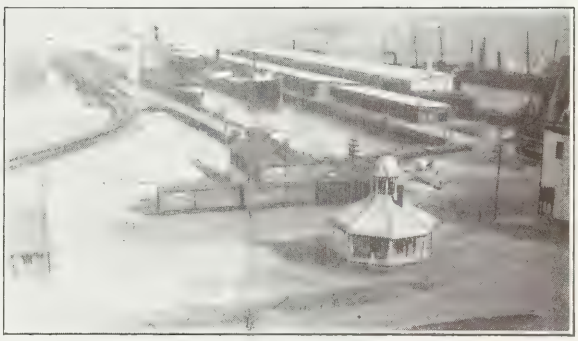
Miramichi River.

The Miramichi river is the second river in importance in New Brunswick. Its branches are numerous and drain a large extent of country. This river empties into the Gulf of St. Lawrence. It is navigable for a distance of 42 miles from its mouth by large vessels and still farther, for several miles, by light draft vessels, but the river is greatly influenced by tidal waters. Chatham and Newcastle, located on its banks, are important lumber ports; the first is about 30 miles from the mouth or bay, and the latter 42 miles. Extensive lumbering operations and shipment of lumber have been carried on for a century or more. The northwest arm and southwest arm unite about 15 miles from the mouth of the river, while three of the northwest branches spring from a chain of lakes not far from the Tobique and Nipisiguit rivers.

In closing this summary of inland navigation it is well to repeat what has already been stated, namely, that a detailed description of the larger waterways, or mention of minor rivers and lakes, known to be navigable, is impossible in a book intended to give a bird's-eye view of Canadian fresh waterways. Nor has an attempt been made to describe the natural scenery. The magnificence, beauty and grandeur are striking features that engage the attention of all who voyage on them. It has been asserted that Canada discharges more fresh water into the sea than any other country.

Fort William, Ont.

An inter-urban train, between Port Arthur and Fort William.



Port Arthur—The docks.

Port Arthur—The Whalen ice-breaker.

Kaministiqua Power plant, near Port Arthur, Ont.

LENGTHS OF RIVERS.

ATLANTIC.	MILES.
Hamilton (to head of Ashusnipi)	350
Natashkwan	220
Romaine	270
Moisie	210
St. Marguerite	130
St. John	390
Miramichi	135
St. Lawrence (to head of St. Louis)	1900
Manikuagan	310
Outarde	270
Bersimis	240
Saguanay (to head of Peribonka)	405
Peribonka	280
Mistassini	185
Ashwapmuchuan	165
Chaudiere	120
St. Maurice	325
Mattawan	100
St. Francis	165
Richelieu	210
Ottawa	685
North	70
Rouge	115
North Nation	60
Lievre	205
Gatineau	240
Coulonge	135
Dumoine	80
South Nation	90
Mississippi	105
Madawaska	130
Petawawa	95
Moira	60
Trent	150
Grand	140
Thames	135
French (to head of Sturgeon)	180
Sturgeon	110
Spanish	153
Mississagi	140
Thessalon	40
Nipigon (to head of Ombabika)	130
HUDSON BAY.	
Nelson (to head of Lake Winnipeg	390
" (to head of Bow)	1660
Red to head of Lake Traverse	355
" to head of Sheyenne	545
Assiniboine	450
Souris	450
Qu'Appelle	270
Winnipeg to head of Riresteel	475
English	330
Saskatchewan (to head of Bow)	1,205
North Saskatchewan	760
South Saskatchewan (to head of Bow)	865
Bow	315
Belly	180
Red Deer	385
Churchill	1,000
Beaver	305
Kazan	455
Dubawnt	580
Severn	420
Winisk	295
Attawapiskat	465
Albany (to head of Cat R.)	610
Moose (to head of Mattagami)	340
Mattagami	275
Abitibi	340
Missinabi	265
Harricanaw	250
Nottaway (to head of Waswanipi)	400
Waswanipi	190
Rupert	380
Eastmain	375
Big	520
Great Whale	365
Leaf	295
Koksoak (to head of Kaniapiskau)	535
Kaniapiskau	445
George	365
PACIFIC.	
Columbia (total)	1,150
" in Canada	465
Kootenay	400
Fraser	695
Thompson (to head of North Thompson)	270
North Thompson	185
South Thompson	120
Chilcotin	145
Blackwater	140
Nechaco	255
Stuart	220
Skeena	335
Alsek	260
Yukon, (mouth to head of Nisutlin)	1,765
(int. Bdy. to head of Nisutlin	655
Stewart	320
White	185
Pelly	330
Macmillan	200
Lewes	338
ARCTIC.	
Mackenzie (to head of Finlay)	2,525
Peel	365
Arctic Red	230
Liard	550
Fort Nelson	260
Athabaska	765
Pembina	210
Slave	265
Peace to head of Finlay	1,065
Finlay	250
Parsnip	145
Smoky	245
Little Smoky	185
Coppermine	525
Backs	605

MARITIME NAVIGATION.

Canada has a sea coast line of 5,000 miles on the Atlantic coast and 7,000 miles on the Pacific coast. This does not include any portion of Hudson strait, Hudson bay nor the northern waters within the Arctic regions; nor is the whole of the St. Lawrence route included in the sea coast of the country. On the Atlantic side, the sea shores of Quebec, Nova Scotia, New Brunswick and Prince Edward Island comprise the sea coast line of eastern Canada.

The St. Lawrence route is first in importance, with regard to the volume of trade and passage of vessels in interoceanic navigation. Montreal is an ocean port although tidal waters do not reach within 82 miles of the port, nor does the rise and fall of the tide affect navigation, for large vessels, nearer than 87 nautical miles from this sea-port. The artificial ship-channel, between Montreal and Quebec, is of sufficient depth for large ocean steamers of 10,000 tons, to navigate to Montreal. The route is well sheltered, and the sea comparatively smooth, after entering the Gulf of St. Lawrence from the Atlantic ocean for a distance of 900 miles.

The ship-channel has been described in this work under the heading of Inland Navigation, but a few general outlines are given under Maritime Navigation. The channel, technically speaking, extends from Montreal to the Lower Traverse, a distance of 220 miles from Montreal. The shallow sections have been dredged from the former depth of 10 feet to 30 feet in depth, at the lowest stage of the water, in the river. In spring, owing to the vast discharge of water from the Great Lakes or basins above, the water reaches a greater height in the narrow stretches of the river. The depth varies from 36 to 37 feet at the highest stage of water in Montreal harbour. The width of the dredged channel is 450 feet in the straight parts, and from 500 to 800 feet, in the bends.

The distance in the channel from Montreal to Quebec is 160 miles and ocean-going, deep draught vessels, have always been able to

Montreal Harbour.—One of the Basins with Sheds.

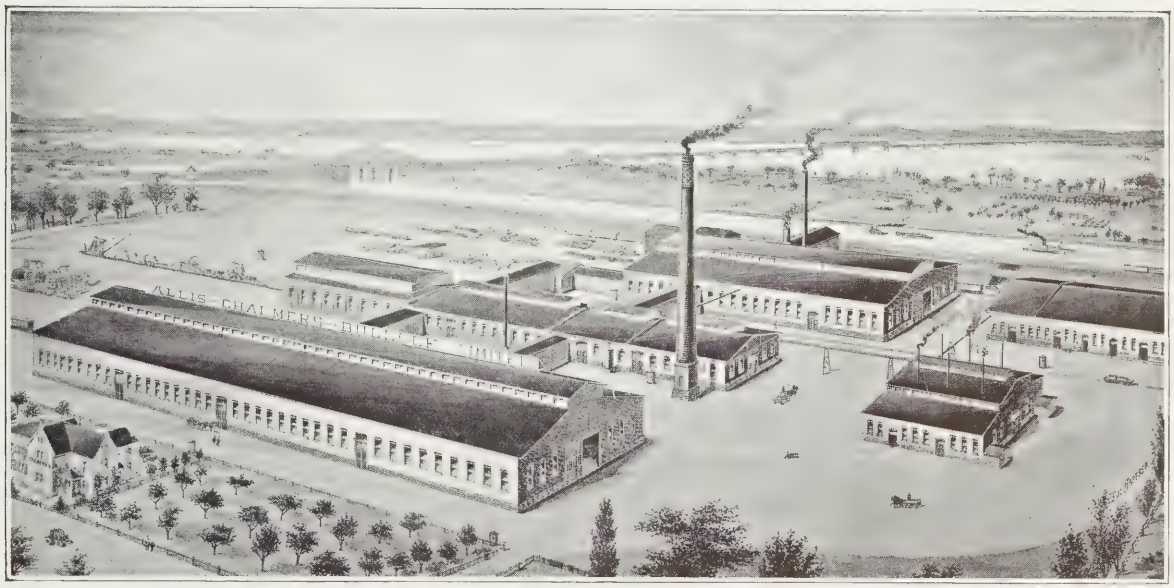
Montreal Harbour—View from the Grand Trunk Elevator.

Grand Trunk Railway System—Grain elevator at Montreal.

navigate to Quebec, consequently this port is the principal sea-port on the Lower St.Lawrence.

The waters of the St. Lawrence may be termed an estuary as far up as Batiscan, a few miles above Quebec. From Quebec downwards deep water is found, with the exception of the Beaujeu, St. Thomas and St. Roch channels, which have been dredged.

From these channels downwards, not less than 8 fathoms is obtained in the channel, and, in the course of ocean vessels, any depth from 8 to 150 fathoms are found, before the mouth or dividing line of the River and Gulf is reached.



Montreal—The Allis-Chalmers-Bullock, Limited, shops.

The river gradually expands below the mouth of the Saguenay river, which empties into it, until it is over 30 nautical miles wide, but at its mouth or the dividing line, at Point des Monts, it contracts to a width of 23 nautical miles. The northern shore of the river is very irregular, forming many bays of considerable width.

Gulf of St. Lawrence.

The Gulf of St. Lawrence is an inland sea, enclosed by Canadian territory on the north and south, and by Newfoundland on the east. Three straits form the entrances from the Atlantic Ocean; two on the eastern side of the Gulf, namely, the Strait of Belle isle on the north side of Newfoundland, and Cabot strait on the south side of the same Island. The narrowest part of the Strait of Belle Isle, is 10 nautical miles; the width of Cabot strait, between Cape Breton Island, Nova Scotia, and Point aux Basque, Newfoundland, is 56 nautical miles. Vessels enter both straits on the way to Montreal, but the Belle isle route is not open for navigation in the Spring as early as the other route, owing to Belle isle strait being blocked by ice, which descends from northern waters.

The depth of water in the Gulf varies in the track of ocean vessels north of Bird Rocks and St. Pauls island, and south of Anticosti island, from 150 fathoms in the western end of the Gulf to over 280 fathoms in Cabot strait. The soundings in the Strait of Belle isle, show a depth varying from 22 fathoms to 100 at low water. North of Anticosti island the water is also deep, but ocean vessels do not take this course.

The Atlantic ocean and the southern part of the Gulf, are connected by the Strait or Gut of Canso. The depth in this Strait is from 10 to 20 fathoms at low water.

The area of the Gulf is 101,562 square miles and its coast is very irregular. Extensive fishing operations have always been carried on in the Gulf by the fishermen of Quebec, Nova Scotia,

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CIGAR
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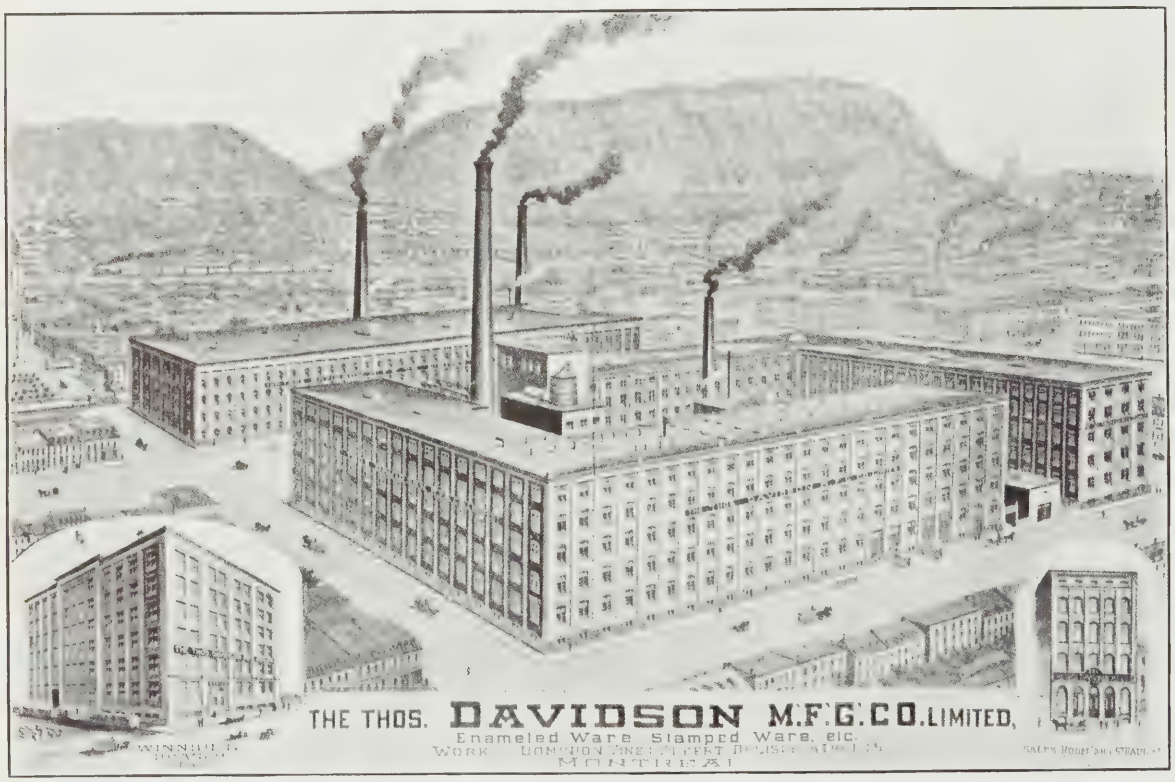

THE THOS. DAVIDSON M.F.G.CO. LIMITED,
Enameled Ware Stamped Ware, etc.
MONTREAL

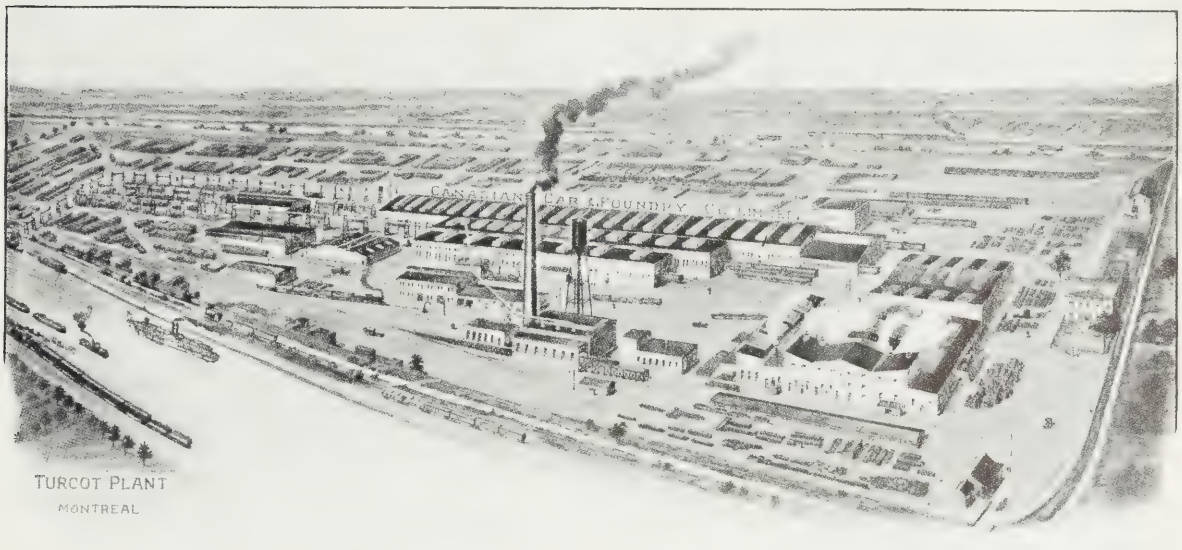
New Brunswick, Prince Edward Island, Newfoundland and United States fishermen as well.

Improvements in the St. Lawrence river, in addition to the ship-channel, are breakwaters and harbour improvements. The largest expenditure of labour and the greatest in cost have been the works in Montreal harbour. The selection of the harbour as the chief inland, as well as the chief sea-port, made it necessary to undertake a large amount of excavation work and, the building of piers, sheds and transfer railway tracks, upon which cars and locomotives belonging to the harbour, have

Montreal Harbour.

one with a capacity of 1,000,000 bushels and another, that will store 2,000,000 bushels, is now under construction. These elevators have marine legs for unloading from vessels. The Grand Trunk Railway Company owns an elevator which unloads from cars and discharges into vessels. In addition, floating elevators are moored between lake steamers and ocean going vessels, and take grain from one and deliver it into the other.

The wharfs have a lineal measurement of 7 $\frac{4}{10}$ miles, with water alongside, of from 31 to 34 feet, excepting one wharf. The harbour is equipped with a fire tug, a 75 ton floating crane,

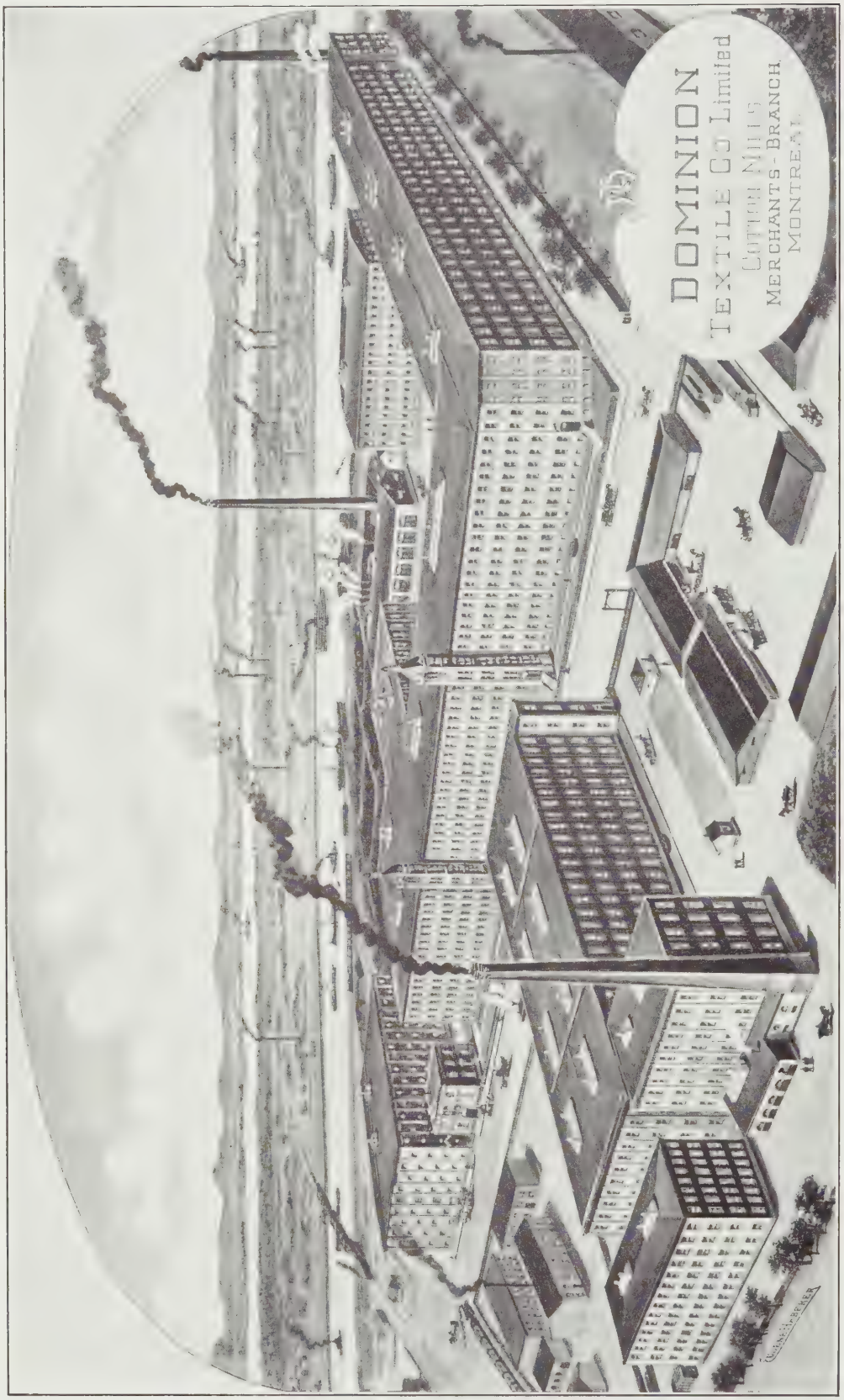


Canadian Car and Foundry Co., Montreal.

been placed. Fourteen large piers at right angles to the shore have been built, and 14 large steel sheds; between the piers are shore sections. Berths for vessels are obtained at the projecting piers and alongshore sections. The work has been constructed to a height that will meet high water conditions in the Spring. Sheds with lower and upper floors have been constructed, and grain carrying galleries from elevators to the ships holds have been erected. This system enables vessels to load grain at their berths whilst, at the same time, loading or discharging other cargo. Grain elevators have been erected by the Harbour Commissioners; and other loading and unloading machinery, and coal hoists.

During the past year, part of the ship channel dredging plant, has been engaged in dredging a channel to a location for a dry dock. The Harbour Commissioners, amongst other plans for improvements and expansion of the harbour are contemplating the construction of a dry dock, to admit any size ocean going vessels that may require to be docked.

Great advance has been made towards making the harbour an up to date port, and with the projects now in hand, Montreal will, in the course of a very few years, rank high in the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ports of the world. The acetylene lighted buoy system in the ship channel, and port of Montreal is not surpassed anywhere.

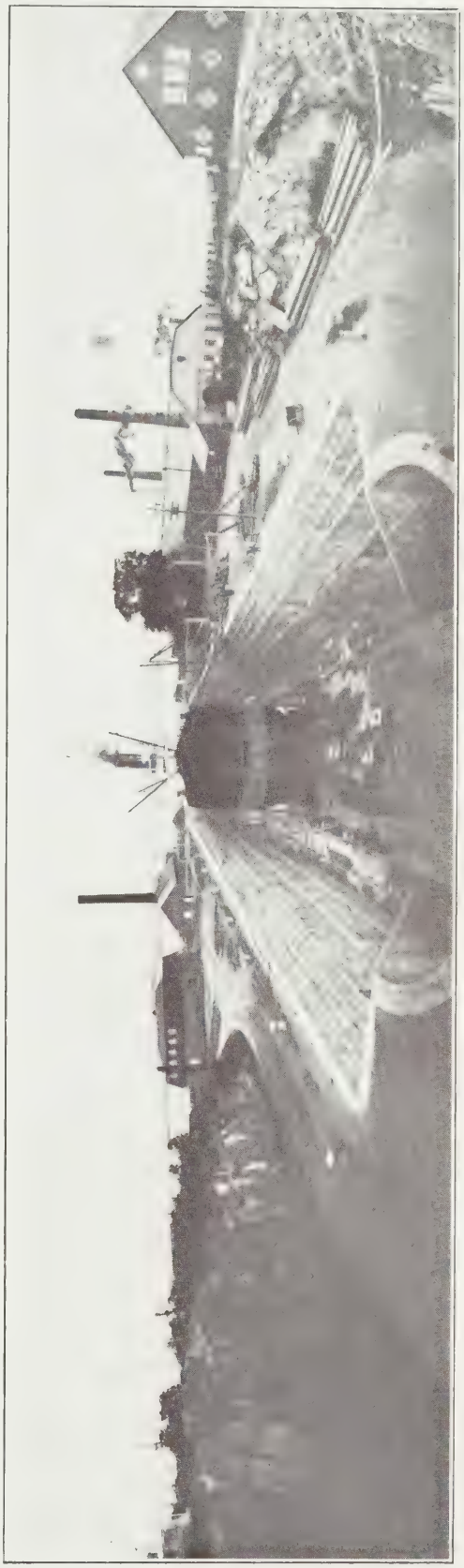
Quebec Harbour.

Quebec Harbour has been greatly improved, but the improvements have not been so extensive, in recent years, as in Montreal. The Harbour is under the control of Harbour Commissioners, and steady progress is being made yearly, in enlarging and improving it for the large class of ocean vessels which now enter.

The harbour now comprises the river and its navigable tributaries between St. Patrick hole and Carouge Point, (Cape Rouge) distant about eight miles above the city. The harbour, over its greater part, affords excellent anchorage but anchorage is prohibited between certain lines, to prevent interference with the movement of vessels. The lines are indicated by sign boards and red lights. The harbour affords wharfage accommodation for a large number of vessels of all dimensions and draught. Inner and outer basins have been dredged. An area of 40 acres, water surface, is called the wet dock with depth of water from 18 to 25 feet. The tidal harbour is a basin of 20 acres area water surface, and it is divided from the wet dock by a cross wall.

The deep water quays, in another part of the harbour, have a depth of water alongside of 40 feet, low tide. The dry docks are located at Levis across the river; one under the control of the Harbour Commissioners has a length of 600 feet, breadth of 62, depth of water on the sill 26½ feet and 23 feet on the blocks at high water, spring tides. Two floating docks are owned by the Geo. T. Davie and Sons Company, and are sometimes lengthened by water-tight compartments. Another floating dock is called Russels' floating dock and to this establishment belongs a gridiron.

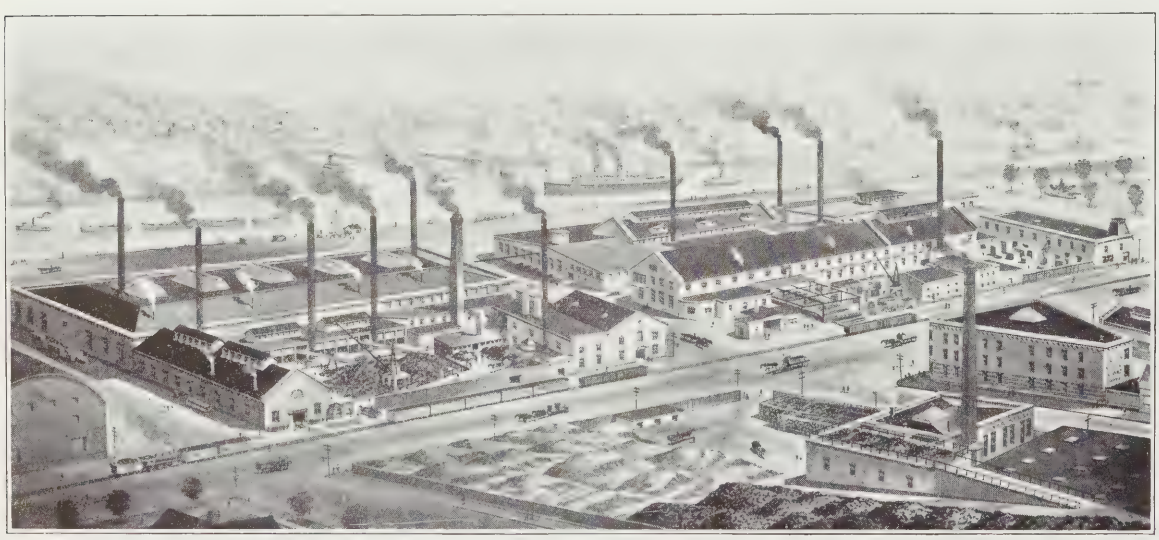
In the harbour of Quebec, is a twenty-five ton crane and a nine ton steam hammer. Repairs are made to hulls, machinery and boilers of large vessels in Quebec. The tide rises 18 feet at springs and 12½ at neaps. Ferry steamers ply between Quebec and Levis constantly, summer and winter.



Levis, P.Q.—The Dry-dock.

Dominion Bridge Co., Montreal—View of shops taken from roof of General Office

The Canadian Rubber Co. of Montreal, Limited, Montreal.

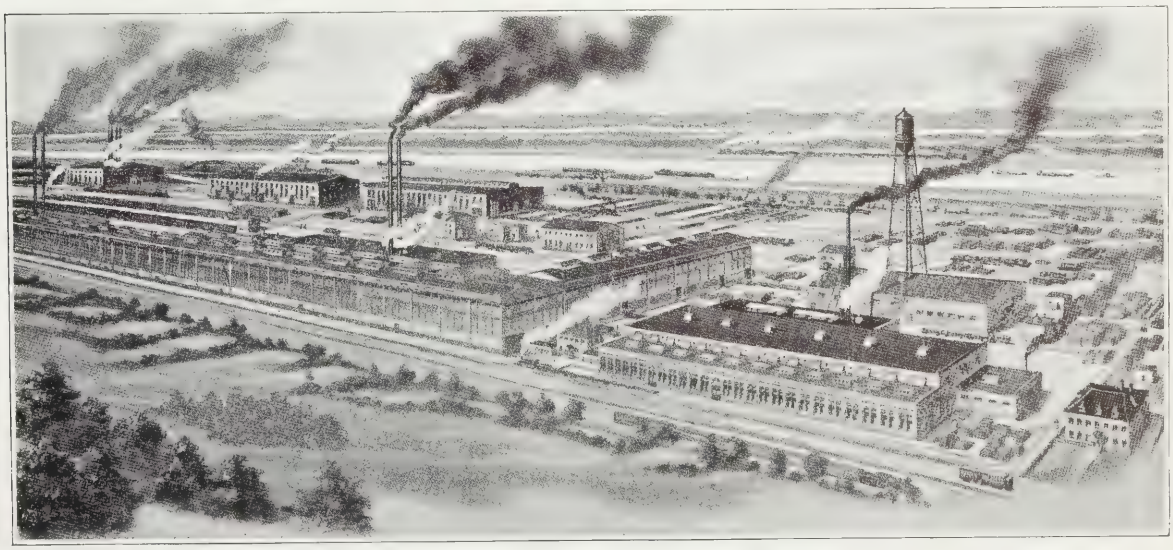


Montreal Steel Works, Limited.

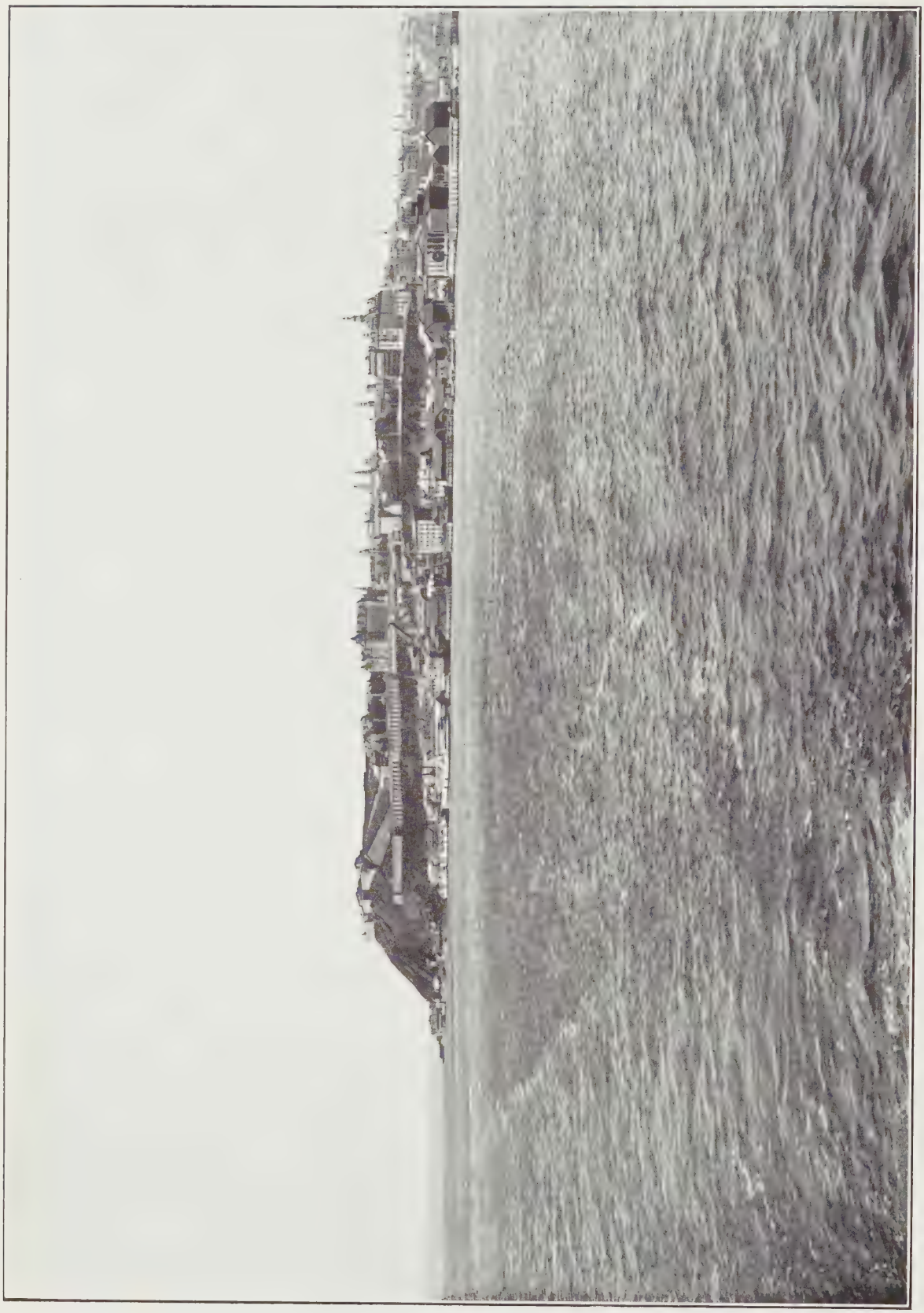
Three Rivers Harbour.

Three-Rivers Harbour, between Montreal and Quebec, is situated on the north shore of the St. Lawrence river. The harbour has constant communication with Montreal, Quebec and ports inland and in the United States, via the Richelieu river, on the south side of the St. Lawrence. The port has excellent facilities for ocean going vessels. The channel along the wharfs is from 30 to 50 feet in depth and there is a roadstead of from 1,200 to 1,500 feet in width. The present wharf accommodation extends from the St. Maurice river up to what is called the ice-breaker, a distance of 5,500 feet. The harbour is under the control of Harbour Commissioners and the wharfs are spacious, both for ocean and inland vessels. A railway line runs the whole length of the water front, and branches connect the port with manufacturing centres. Facilities for transferring freight from cars to vessels and vice versa, are good. Navigation at this port, as well as the other ports mentioned, has been greatly improved by dredging and removal of natural obstructions, also, by construction of mooring, loading, projecting and alongshore wharfs and embankments. Other harbours in the province of Quebec might be included in this general description of the St. Lawrence route, but it would extend the subject to an unreasonable length in a book of this nature.

Many natural harbours are found along this route, which, from the earliest date in the history of the country, have been important shipping points for natural products. Maritime navigation, during the season of navigation between Great Britain in particular, foreign countries and Canada, has always been a subject of the greatest importance. The Federal and Provincial Governments, harbour boards and companies, have expended vast sums of money in improvements required to make this important highway navigable to certain points, where exportation and importation have played their part in developing the country, and supplying the wants of the inhabitants. In Quebec Province alone, over 100 harbours might be counted which afford loading grounds and shelter for vessels, while engaged in the trade of the St. Lawrence. In a table published in the Annual Report of the Public Works Department, the cost of dredging and cubic yards of material removed, covering a period of 37 years, shows at a glance, the number of harbours and localities, in the Gulf and Lower St. Lawrence, used principally by fishing vessels for harbours of refuge and for outfitting. The importance of these harbours is manifested by the great number of fishing vessels which depart from them during the fishing season. The harbours are also used by fleets of fishing boats, and immense quantities of herring,



Canadian Car and Foundry Company, Limited, Montreal.



Quebec as seen from Levis.

mackerel and cod are cured for home consumption and export. Important in the navigation of the St. Lawrence route, is the Quarantine station at Grosse isle, and from the Report of the Department of Agriculture, which has under its purview the matter of quarantining vessels reported with infectious and contagious diseases on board, is taken a brief description of this station. A diagram of this station, accompanies the report of Dr. Montizambert, Inspector General of Public Health. The station has three divisions. In the healthy division the following buildings have been erected, namely, baggage shed, disinfecting plant, pump and dynamo station, detention buildings, water reservoir, laboratory, wash house and lavatories, and administration building. In the Central Division, are a guard house and the residences of the Medical officers, one Anglican and one Roman Catholic Church, a parsonage and R. C. presbytery, Marconi wireless station and water reservoir. In the sick division are two hospitals and two disinfecting sheds. The report of Dr. Montizambert contains a synoptical report of the origin of epidemics abroad, and the means taken to stamp them out.

Grosse Isle Quarantine Station.

At Grosse Isle, in 1911, the number of vessels inspected was 378, an increase of 14 over the previous year, and an increase of 41 per cent of passenger-carrying vessels; persons inspected, 178,167, an increase of 57,941 over the previous year; admissions to hospital 727. Diseases were Asiatic cholera, scarlet fever, diphtheria, measles, enteric fever, mumps and erysipelas. The deaths were 11. Owing to the increasing immigration by the St. Lawrence route, this station is becoming extremely important in order to guard against diseases of a virulent nature entering Canada from abroad.

In closing the description of the St. Lawrence Gulf and river, allusion to two important bays are appropriate, because of their size and importance. Gaspe bay is in the western part of the Gulf. The Bay extends 17 miles in a north, north-westerly direction from Cape Gaspe, and contains an excellent outer roadstead and Gaspe harbour at its head, capable of holding a numerous fleet, and a basin where large ships can be outfitted.

Gaspe Bay.

Chaleur bay is a wide and deep indentation south of Gaspe bay, and is the largest bay in the gulf, being 25 miles wide across its entrance. The northern shore is in the Province of Quebec, and the southern shore in New Brunswick. There are numerous settlements along the shore, and several harbours and rivers, entered by vessels engaged in the lumber and fishery trade. The Restigouche river empties into the bay at its head. Campbellton, an important sea-port is at the mouth of the Restigouche river.

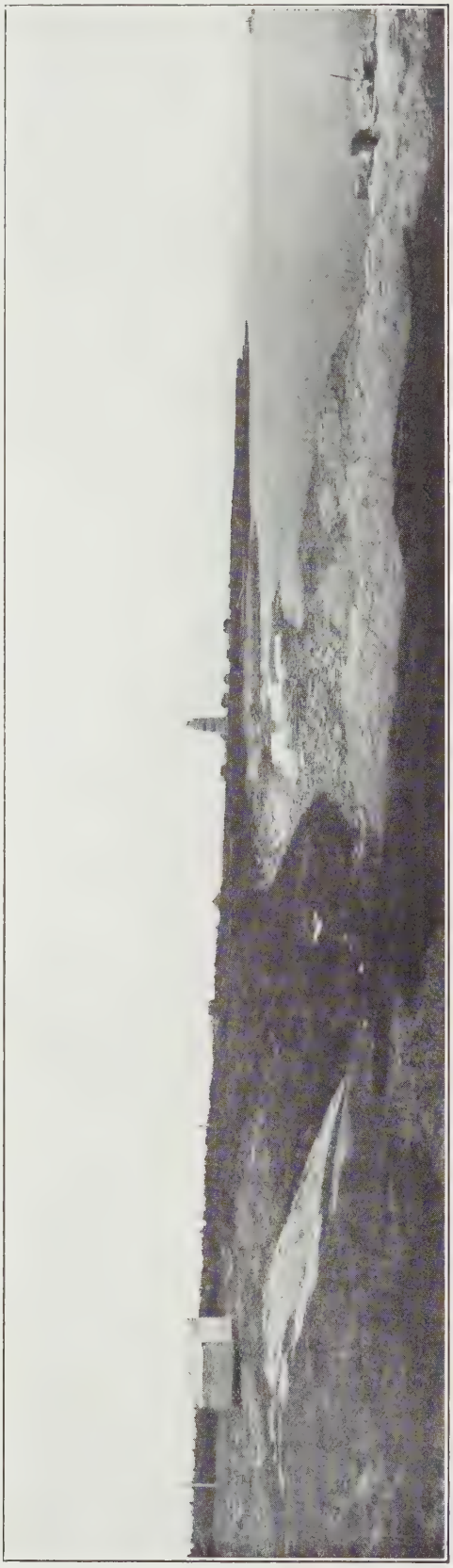
Chaleur Bay.

Anticosti Island is in the north western part of the Gulf, and is 122 miles long by about 30 miles wide. There is no good harbour for large vessels on the coast but bays afford anchorage for light draught vessels, and a breakwater pier 3,476 feet long, has been built in Ellis bay. Vessels drawing

Islands in the Gulf.

Percé Rock—Gulf St. Lawrence.

Cap Rosier Lighthouse—Gulf St. Lawrence.



Southwest Point Lighthouse, Anticosti.

Gaspé Basin—Gulf St. Lawrence.

12 feet of water moor at this pier, at any stage of the tide.

Magdalen islands are in extent about 35 miles long and of irregular shape. The principal harbours are Grand Entry harbour and House harbour. Pleasant bay, at the eastern end of Amherst island, affords shelter to fishing vessels in all winds, in June, July and August.

ATLANTIC COAST AND BAY OF FUNDY.

Next in importance to the St. Lawrence route, is navigation along the Atlantic coast and Bay of Fundy. Cape Breton Island, Nova Scotia, is of an irregular triangular form. It is indented with bays on three sides but only one good harbour may be said to exist on the western

Montreal—S. S. "Teutonic" bunkering at Nova Scotia Steel and Coal Co.'s coal towers

Nova Scotia Steel and Coal Co.—Discharging and bunkering plant at Quebec.

side. At its eastern end, the inlet of Bras D'Or enters the north eastern side of the island, and forms a lake about 45 miles in length, which is continued by a cut named St. Peters Canal. This inlet is navigable from the northeastern side of the island to the entrance of the strait of Canso, on the south western end. The inlet, or Bras D'Or lake affords excellent facilities for commerce and for fishing operations. Several harbours or ports are centres of trade and commerce and mining operations.

St. Peters Canal.

St. Peters Canal connects St. Peters bay on the southern side of Cape Breton with the Bras D'Or lakes. It crosses an isthmus, half a mile wide, and gives access from the Atlantic. Length of canal about 2,400 feet, breadth of water line 55 feet; there is a tidal lock and two pairs of gates; dimensions of lock 200 feet by 48 feet, depth of water on sills 18 feet at lowest water, depth through canal 19 feet; extreme rise and fall of tide, 4 feet.

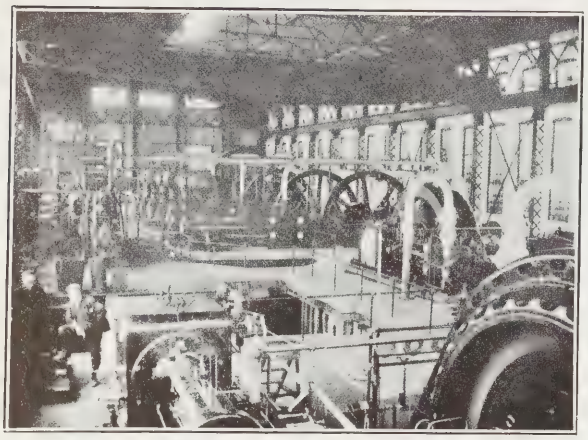
The principal harbours of Cape Breton are Sydney, North Sydney, and Louisburg.

Sydney Harbour.

Sydney harbour is an inlet, extending south-westward five miles from its entrance in the south-western part of Cabot strait or Atlantic Ocean. The harbour has a general width of $1\frac{1}{10}$ mile; it divides into West arm, which runs south-westward for $3\frac{3}{4}$ miles to Ball creek, with a general width of $\frac{3}{4}$ of a mile; and South arm which runs southward and south-westward for five miles, with a width decreasing from nearly a mile to $1\frac{1}{2}$ cables. The harbour is entirely land locked, with a depth of water of from 6 to 10 fathoms, and no obstructions. The area of water, from 5 to 7 fathoms in depth, is approximately 2 square miles in the harbour of Sydney. The depth of water along some parts of the frontage of the town, is over 8 fathoms, within a few feet of the shore. The rise and fall of the tide is 6 feet at springs, and 4 feet at neaps.

The Dominion Coal and Steel Company has extensive works at Sydney, and coal piers from which large quantities of coal and steel are shipped; ocean-going vessels and coasting steamers

Dominion Coal Co.—No. 6 Colliery from the rear.



Dominion Coal Co.—Compressor House.

obtain their bunker coal at this port. The lights are Low point light, east side of entrance to Sydney, latitude 40° 16′ 12″, longitude 60° 77′ 22,″ with a fog alarm building and a marine telegraph and signal-station; Sydney range lights—front light on a point south side of west arm of Sydney harbour, back light half mile, 59° west from front light; there is also a gas and whistling buoy near Low point moored in 19 fathoms of water, and a gas buoy near Sydney southeast bar, moored in 7½ fathoms of water.

North Sydney Harbour.

North Sydney harbour is a safe harbour, easy of access for vessels of all sizes and draught; it is the most important port of call for ocean vessels on their way to other ports in the eastern waters of Canada, as well as a large coal-shipping port. The water area of the harbour is about 12 square miles, with a depth available of 46 feet at high water and 42 feet, low water. The port is a terminal of the Intercolonial Railway and the railway pier has a depth of 24 feet of water alongside for 200 feet in length of the pier, at high water.

The Nova Scotia Steel and Coal Company has extensive steel works at this port and two large piers, one 900 feet long, water 28 feet at high water. Storage pockets for coal with capacity of 5,000 tons, the other pier is 650 feet long. The depth of water between the two piers is 28 feet. Chutes for discharging coal are located on the shorter pier. There is a breakwater east of these piers, about 1,500 feet in length, with 16 feet depth of water alongside for 300 feet. There is also a marine railway at which vessels of 250 tons can be hauled out. North Sydney roads afford good open anchorage with off-shore winds; these roads are much used by vessels seeking freight, and vessels anchoring are exempt from port charges. The harbour

Draeger Apparatus—Helmet type—Dominion Coal Co.

Draeger Apparatus—Mouth-breathing type—Dominion Coal Co.

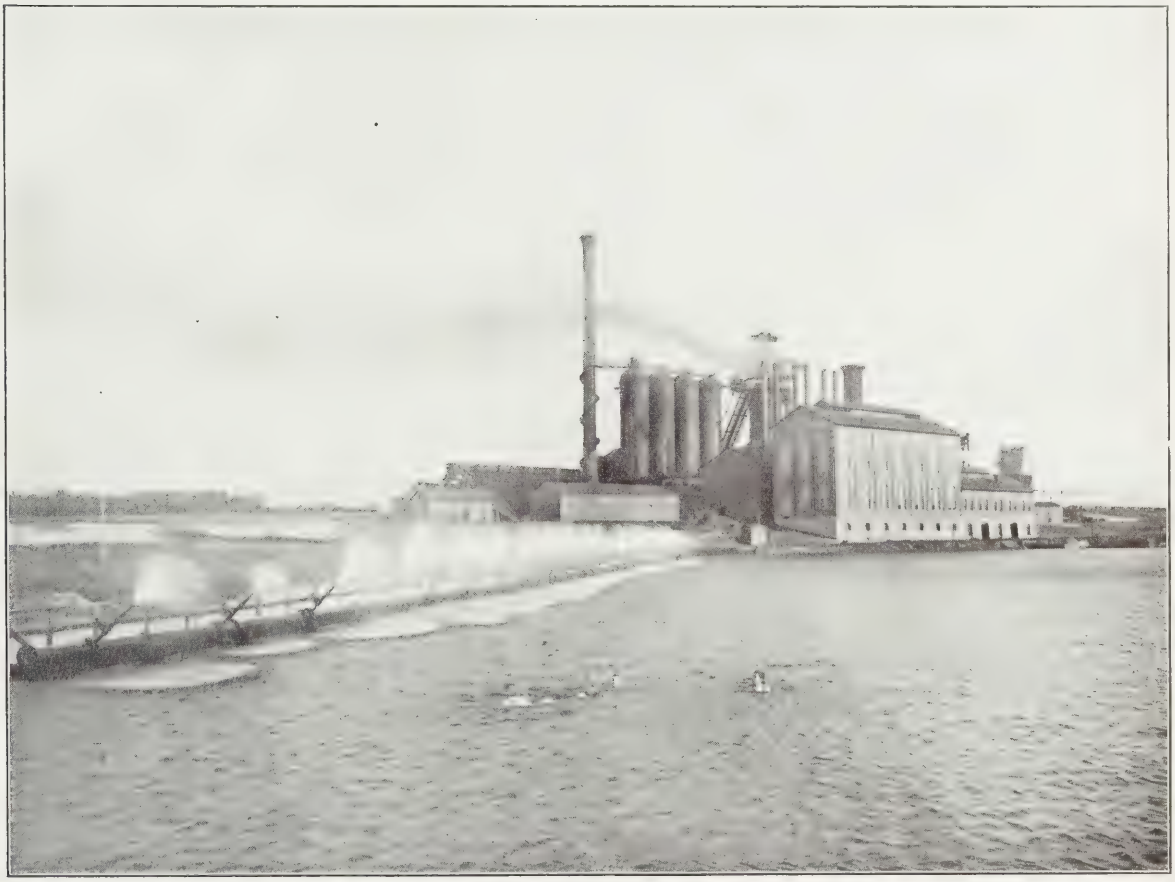
is under control of Harbour Commissioners. The lights are the same as for the port of Sydney.

Louisburg Harbour.

Louisburg Harbour is south of Sydney harbour. Its entrance is from the Atlantic Ocean, in latitude 45° 55′ N, and logitude 59° 58′ W. The entrance is between Lighthouse point and Rocky and Battery islands and is about 3¾ cables wide, but the navigable channel is 2 cables wide. Within the entrance, south-west arm continues westward over one mile, with a general width of 3 or 4 cables; the water in this arm is from 25 to 44 fathoms and in the harbour is deep water in all parts. The lights are, Louisburg light on the north side of the entrance to the harbour, in Latitude 45° 54′ 35″ N, Longitude 59° 57′ 15″ W., and is a fixed white light, visible 16 miles, a diaphone fog alarm is also operated here. Two range lights are on the west shore of the harbour and two coal-wharf range lights lead to the Dominion Coal Company's wharfs. The principal wharfs belong to the Dominion Coal Company and are 700 feet long, water from 25 to 35 feet deep, and another wharf has a railway siding the full length of the wharf. Large quantities of coal are shipped from this port in summer and winter.

The extreme eastern point of Cape Breton Island is Cape Breton, east of Louisburg; and still further east is Mira bay; Gabarus bay is west of Louisburg harbour. These two bays are the principal indentations of the coast of Cape Breton Island on the southeast coast. The contour line of soundings averages 40 fathoms of water along the coast until the strait of Canso is reached. This coast is indented by numerous small bays and harbours.

An important headland is Cape Canso at the entrance of the strait and north-west of this headland is Chedabucto bay. From Cape Canso



Blast furnaces Nova Scotia Steel and Coal Company, Sydney Mines, Cape Breton.

Ore discharging and coal loading piers—Nova Scotia Steel and Coal Co., North Sydney, C.B.

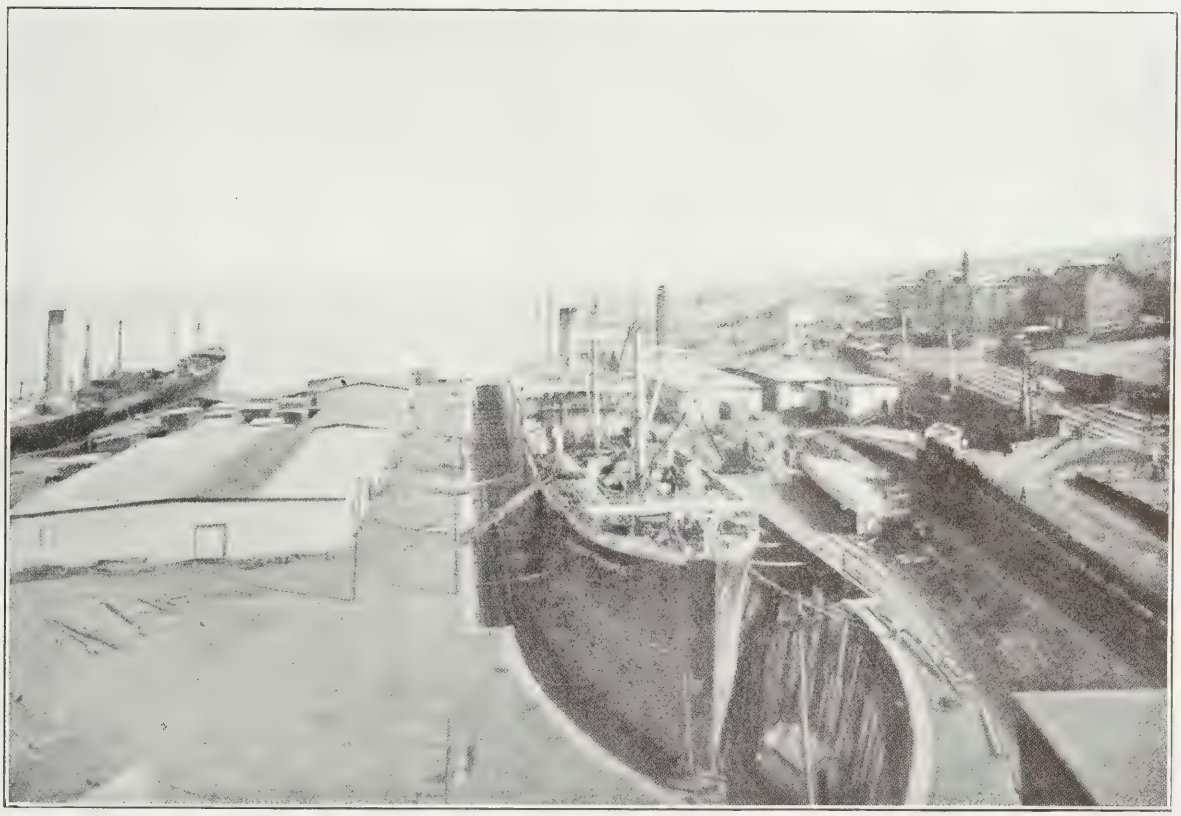
to Halifax, the coast contains a number of coves and small harbours.

Halifax Harbour.

Halifax Harbour is one of the finest and safest harbours in the world. It is open all the year round, and has direct communication with all important ports of the world, by sailing vessels. Steamboat lines communicate with ports on the American continent, interoceanic and coast ports.

The entrance of the harbour lies between Devil's island and Chebucto head; it is 5¾ miles wide extending in a north-westerly direction for about 13½ miles to the head of Bedford basin. From Georges island to the narrows—a distance of 3 miles—the harbour is about three quarters of a mile wide, with a depth of water of from 10 to 14 fathoms at low tide, and good anchorage ground, but at the narrows, the harbour contracts to about one quarter of a mile and then expands into Bedford basin, which has an area of 10 square miles, completely landlocked. The Citadel is 127 feet above the sea at high water and with its flagstaff, is a leading landmark, easily recognised by a vessel off the entrance of the harbour. A gun is fired at the Citadel at noon, mean time of the 60th meridian, equivalent to 4 h. om., os., Greenwich mean time. There are lighthouses in the harbour and immediate approches, three of which have also fog-alarm buildings. The wharf accomodation is spacious. Halifax harbour has also one of the largest graving-docks on the continent. This graving dock is 600 feet long, with a frontage of 850 feet; water from 36 to 51 feet at low tide. Breadth of entrance to the graving dock is 87¾ feet, with a depth of 30 feet on the sill, at high water, equipped with ample plant of a modern description for executing extensive repairs to steam vessels.

Men-of-war in Halifax harbour, from Quebec S. S. Company's Circular.



Halifax, N.S.—S. S. "Mount Temple" in dry-dock.

The naval dockyard at Halifax is controlled by the Department of Marine and Fisheries and has a length of 2,700 lineal feet and the depth of water is from 12½ to 36 feet; the crane equipment at the dock will lift from 2 to 15 tons.

Halifax is a terminal of the Intercolonial Railway.

At Camperdown near Halifax is a time station and a wireless station, by which the time is distributed to vessels at sea, within the zone of the Marconi station.

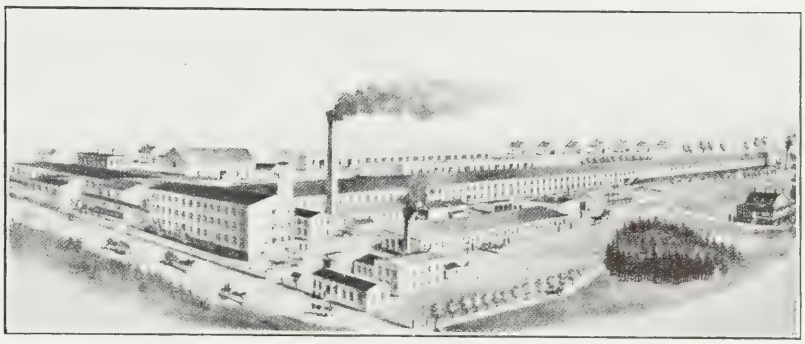
The distances from Halifax to ports in Great Britain and continental ports where steamboat lines are running, are as follows; Halifax to Liverpool 2,485 miles; to London 2,719 miles; to Queenstown 2,255 miles; to Glasgow 2,408 miles; to Antwerp 2,759 miles; to Havre 2,680 miles; and to Hamburg 3,026 miles.

From Halifax to Cape Sable on Cape Sable Island the extreme western part of Nova Scotia a number of harbours are situated. One of the principal ports is Lunenburg situated in Lunenburg bay. The bay is 5 miles in depth and 2½ miles wide between the entrance points. It is open to the southeast but Cross Island acts as a breakwater. A very large fleet of fishing schooners of the best type is owned, manned and outfitted at this port besides a number of fishing boats. The fishing vessels range from 10 to 110 tons net, and the crews number from 3 to 5 in the small vessels and from 15 to 22 in the large schooners. The value of fresh, pickled, dried and canned fish and fish products in 1910–11 marketed at this port was $3,512,026.

Bay of Fundy.

The bay of Fundy lies between the province of Nova Scotia, New Brunswick and the State of Maine. It is noted for the range of tides all along its shores. At Cape Sable the rise is 11 feet but at Noel bay in Minas basin the tides rise and fall 50½ feet. At low tide the flats are dry in many harbours and bays and vessels are left high and dry until the tide rises again.

Halifax—Red Cross Line steamers leaving port—G. S. Campbell & Co.'s wharf.



Consumers Cordage Co., Halifax.

Halifax, N.S.—Wharves at deep water.

The orchard-dotted vista of the lovely Annapolis Valley.

Between Yarmouth on what is called the southeast coast of Nova Scotia to the coast of New Brunswick on the Bay are the Annapolis basin, Minas basin, Chignecto bay and Cumberland basin. Amherst in Nova Scotia is at the head of navigation.

The Peticodiac river is an arm or estuary of Chignecto bay and is navigable for a distance of 25, miles, by vessels of ordinary draught, at high water and for a distance of 12 miles farther by light draught vessels. On this river is Moncton in New Brunswick, a converging point for several railroads and will be the eastern terminal of the Grand Trunk Pacific Transcontinental Railway.

The Bay of Fundy is deep and anchorage at high water is difficult. Fogs are frequent and prolonged; on this account navigation is difficult, particularly to strange mariners. The Bay is never frozen over owing to the great rise and fall of the tide. Winter navigation is, therefore, kept up, and St. John, on the northern side of the Bay is the main winter port for ocean liners which carry passengers and freight to and from Canada to European ports.

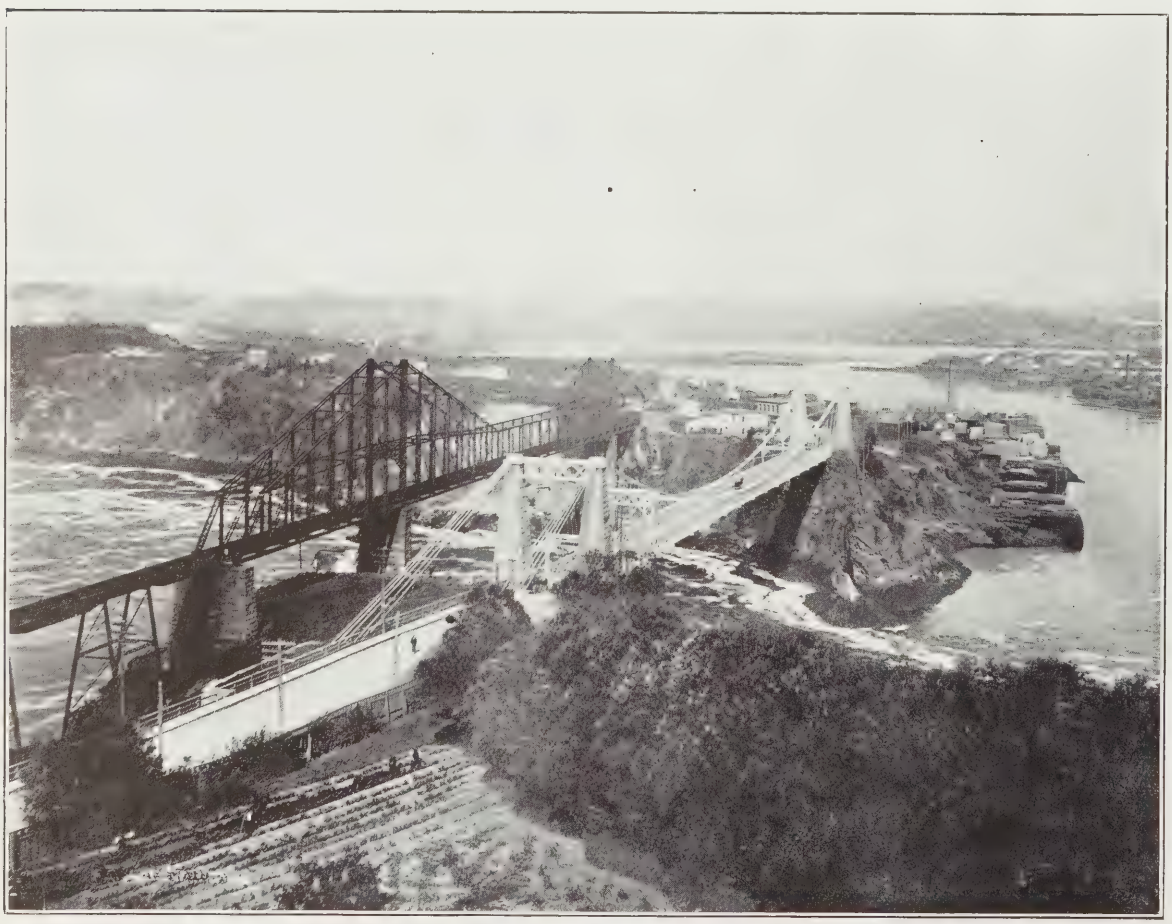
St. John Harbour, N.B.

St. John Harbour New Brunswick, lies at the head of the Bay into which the St. John river flows on the north side of the Bay of Fundy. The harbour is safe, commodious and always accessible. The tide rises and falls in the harbour of St. John from 20 feet at ordinary neap tides to 28 feet at spring tides. The rise and fall of the tides keep the harbour free from ice all the year. The port is the terminus of several steamship lines in winter. Partridge island protects the harbour on the south side; from Partridge island to the head of the harbour is a distance of two and one half miles. There are two chan-

Along the route of the Dominion Atlantic Ry. S. S. Co.—Beautiful Bear River, scene of the picturesque annual chercy carnival.

View on the line of the Dominion Atlantic Ry. S. S. Company.

100 miles of apple blossoms in the Evangeline country.



Intercolonial Railway—Entrance to St. John, N.B.

nels, known as the east and west, one on each side of the island. The east channel is 800 feet wide, varying in depth from 22 feet to 30 feet at low water, spring tides, and is used by all vessels drawing more than 9 feet of water. The channel is being deepened and will shortly be navigable at any stage of the tide, for the largest steamers.

About one mile inside Partridge island, a beacon marks the western boundary of the main channel, and from the beacon looking north to the head of the harbour, it is one and a half miles long and from 1,400 to 2,900 feet wide. This harbour is fully developed.

There are at present in use 18 deep-water berths for ocean steamers, with capacious warehouses, seven berths for steamers drawing not more than 10 feet of water, and one mile of frontage, including slip-faces at which vessels can be moored and receive cargoes, although grounded, without inconvenience or damage. The facilities for repairing consist of sets of blocks owned by the city and private concerns.

The anchorage grounds in and adjacent to the harbour extend over a wide area. For large vessels there is ample anchorage accommodation; the bottom is composed of soft mud with gravel in places.

There are thirty eight wharfs ranging in length from 200 to 1,540 feet. There are fifteen large sheds, besides coal sheds and pockets. There are about eighteen railway sidings belonging to the Canadian Pacific Railway Company, the Intercolonial Railway and the New Brunswick Southern Railway adjacent to the wharf sheds. At 22 wharfs, the depth of water ranges from 18 to 31 feet, at low water. At eighteen wharfs it is 20 feet at high tide.

At St. John west, the Canadian Pacific Railway Company extends its tracks to the Canadian Pacific Railway wharf, Union wharfs 1, 2, 3, and 4 and New South Rodney 5 and 6, upon which wharfs are sheds; the New Brunswick Southern Railway to North Rodney wharf and Nelson wharf, upon which is a coal shed. At St. John east the Intercolonial Railway

St. John, N.B., general view.

Halifax, N.S.—As seen from the fortifications.

extends its tracks to the Intercolonial Railway ballast wharf slip, and to the same slip west and north and to the public pier to Petingell wharf and McLeod wharf, also to the Intercolonial Railway pier east and west.

The Canadian Pacific Railway has a grain elevator at St. John west, from which grain is conveyed to vessels lying at the company's wharf and at the Union wharfs. The conveyor is 1,800 feet long along the front of the wharfs. The capacity of the elevator is 1,032,000 bushels and is in constant use, during the winter season by transatlantic steamers. Excellent cattle sheds are connected with the Canadian Pacific Railway wharfs, so arranged that cattle are taken into them from the cars at one side, and driven aboard the vessels from the other side.

The Intercolonial Railway has connected with its terminal wharf at York point, an elevator with a capacity of 500,000 bushels, equipped with all the facilities for handling grain.

The lights on the approaches and harbour are: one at Tiner point approaching with a fog alarm, latitude 45° 9′ 22″, longitude 66° 11′ 22″; submarine bell off Negro head, Partridge island; lighthouse in the harbour, latitude 45° 14′ 7″, longitude 66° 2′ 45″; Negro point lighthouse; light on a beacon in the harbour; one also on the Intercolonial Railway wharf and one at Reed's point. A bell boat with gas lantern is anchored off Partridge island and a gas buoy off Negro Point. From St. John to Liverpool the distance is 2,710, to Dublin 2,645, to Belfast 2,573, to Manchester 2,745, to London 2,944.

From St. John, the coast continues in a westerly direction until Passamaquoddy bay or inlet is reached. This inlet trends in a northerly direction and its waters are neutral between the United States and Canada. On the western side of the inlet is the St. Croix river, the natural boundary line between the United States and Canada. The port of St. Andrews,

a favorite summer resort, is on the western side of the bay, and above it is St. Stephens. In the Bay of Fundy are several islands at which fog alarm stations have been established, viz: Brier island near the Nova Scotia coast, Grand Manan and Machias, Seal island within the coast line of New Brunswick.

The Bay of Fundy from the western part of Nova Scotia to the head is about 100 miles in length and has an average breadth of 30 miles.

Off the Atlantic coast of Nova Scotia is Sable island. Two light stations are established on it; one on the west end, latitude 43° 56′ 38″, longitude 60° 6′ 39″, one on the east end, latitude 43° 58′ 22″, longitude 59° 44′ 2′. There are six relief stations on the island connected by telephone and patrols, and three life-saving stations. A dangerous submerged bar extends 17 miles northwesterly and westerly, and one at least 14 miles easterly beyond the east light.

Strait of Canso.

The remaining waters to be described are the strait of Canso and Northumberland strait. The strait of Canso has its entrance between Chedabucto bay on the coast of the mainland of Nova Scotia and St. Peters inlet on the coast of Cape Breton island. The strait of Canso continues in a northerly direction to George bay. The depth of water in the strait is from 10 to 20 fathoms, and the rise and fall of the tide 4 feet, springs, and 2 feet neaps. George bay is a wide bay and is an inlet from the Gulf of St. Lawrence on the southern side of the Gulf. The depth of water in the bay is from 17 to 18 fathoms in the centre, but immediately around the shores, the water shallows.

Strait of Northumberland.

The strait of Northumberland trends in a north westerly direction between the province of Prince Edward Island and the northern coasts of Nova Scotia and New Brunswick. The depth of water of the strait varies greatly in depth, ranging from 6 to 22 fathoms. The rise and fall of the tide is irregular, being 3½ feet, spring tide and 2 feet neaps at East point and 9½ feet springs and 8 feet neaps, in Charlottetown harbour. Prince Edward Island has two fine harbours, one at Georgetown open all the year round and one at Charlottetown. The narrowest part of the strait is between Cape Traverse, P.E.I., and Cape Tormentine, N.B.

Winter communication is maintained by powerful steamers which carry passengers and freight between the harbours of Georgetown and Pictou, N.S., in winter, and fine steamers between Charlottetown and Pictou and between Summerside on the west coast of P.E.I. and Shediac, N.B., in summer. These steamers are screw boats with excellent equipment and accomodation for the travelling public. Prince Edward Island is a famous summer resort for

Prince Edward Island—On the north shore.

people from all parts. The shores of the Island are composed of smooth sand beaches on all sides and sea bathers find unequalled surf bathing at almost any point.

Charlottetown Harbour.

Charlottetown harbour on the south and central part of the Island is a fine harbour. The entrance is between Sea Trout and Blockhouse points, and is 4½ cables wide. The water, in the centre of the entrance, is from 7 to 13 fathoms for a width of 2½ cables and then it shoals on both sides. Good anchorage is found in the harbour in 10 fathoms. Several good wharfs afford mooring, loading and discharging accomodation. The Hillsborough river runs in an easterly direction and is navigable for good sized vessels up to Mount Stewart, a distance of 18 miles from Charlottetown.

The light at the entrance of the harbour is on Blockhouse point and should be seen 12 miles seaward.

Several important harbours are situated on the New Brunswick side of the strait of Northumberland, and Pictou harbour in the Province of Nova Scotia is an important coaling port for ocean vessels and coasting steamers. This harbour has a marine slip where vessels are hauled out and repaired. Extensive repair work is done in this port to hulls and machinery.

The harbours on the north side of Prince Edward Island are open to the Gulf of St. Lawrence, are shallow and sand bar harbours, visited principally by fishing vessels. Fishing operations are carried on extensively in several of the harbours, where small schooners and numerous boats are employed and oufitted.

The general improvements of navigation in eastern maritime waters include the construction of breakwaters and deepening of harbours, channels and removal of obstructions by the Federal Government.

Harbour Improvements.

In the waters within the coast line and harbours, bays and coves in Nova Scotia, dredging has been done during, a period of 39 years, in 112 localities. In New Brunswick, the same kind of work has been done, in the same period, in 111 localities and along the coast and in harbours in Prince Edward Island, dredging has been done in 57 localities. The average cost of the extensive dredging was 25 cents per cubic yard.

TIDES AND CURRENTS.

The tides of the eastern coasts of Canada are very varied in character, and exemplify several different types. They vary in range from the largest tides of the world, in the Bay of Fundy, to a tide which is almost inappreciable in the middle of the Gulf of St. Lawrence. They contrast with the tides of the Atlantic coast of the United States, which have a remarkable uniform character from Cape Cod to Florida.

The tide of the open Gulf after entering the St. Lawrence, takes some 4 hours to run up the estuary from Father Point to Quebec where it has a range of 18 feet at the springs. Beyond this it gradually decreases until at Three Rivers, or the head of tide water, it is scarcely appreciable.

The "Bore," Moncton, N.B;

On the outer coast of Nova Scotia, the rise is small and the time of the tide is nearly simultaneous throughout its whole extent.

In the Bay of Fundy the tide rises from 11 feet at Cape Sable to 50½ feet at Noel bay in Minas basin. At Yarmouth, the rise at the springs is 16 feet while in St. John harbour it reaches 27 feet.

One remarkable feature of the tide in this region is the "BORE" at Moncton on the Peticodiac river. At high tide the river at this point forms a sheet of water half a mile in width; while at low water it consists of mud banks and flats, with a stream about 500 feet wide. The average rate of travel of the incoming "BORE" is about 8½ miles per hour and the wall of water is often 5 feet in height. After it passes, the water continues to rise at the rate of a foot in 4 or 5 minutes.

The currents in eastern Canada and around Newfoundland: (1) constant currents, which run more or less continuously in accordance with the general circulation of the water; and (2) tidal currents which are produced or chiefly influenced by the tide.

In Belle Isle strait the current is of a tidal character. The average velocity is 1.50 knots per hour in each direction. Along the Gaspe coast the current sets downward and has a width of about 12 miles. Its greatest strength is at an offing of 4 or 5 miles where it attains a speed of 3½ knots.

The irregular current in the gut of Canso is the result of the difference in the character of the tide at the two ends of that strait.

In the Bay of Fundy, the currents are tidal in their character, running strongly during flood and ebb. The current is as strong down to a depth of 30 fathoms as it is on the surface, and generally turns in direction on the surface and below, at the same time. The velocity of the current in this bay reaches 4 knots an hour, in places.

The Tidal and Current Survey, a branch of the Naval Service, has made investigations of these currents; and also maintains tide gauges in continuous operation throughout the year at Quebec, Father Point, Forteau bay in Belle Isle strait, St. Paul island at the entrance to the Gulf, Charlottetown, Halifax, and St. John, N.B.

Ice Conditions in Canadian Eastern Waters.

Atlantic Coast and Bay of Fundy.

The deep water harbours on the Atlantic coast and Bay of Fundy are open all the year round, but floating ice from the northern waters and from the northern part of the Gulf of St. Lawrence sometimes obstructs and entirely blocks navigation until a change of wind takes place.

Gulf of St. Lawrence Ice Condition.

During spring and autumn, the navigation is rendered difficult; it is closed entirely in winter from the latter part of December until the early part of April. Within the last two years, the Government icebreaking steamer "Montcalm" has made successful trips from Quebec to Seven Islands, in the western part of the Gulf. Navigation between Georgetown in Prince Edward Island and Pictou, Nova Scotia, in the Strait of Northumberland, is regularly kept up by daily communication, by steamers specially built for ice navigation in the passenger and freight traffic. Occasionally the steamers are beset by floating ice which moves backwards and forwards with the tides and winds. The month of March is generally the most trying owing to heavy ice which finds its way south from the northern part of the Gulf.

Maritime Waters of British Columbia, Pacific Coast.

Juan de Fuca Strait.

Juan de Fuca Strait is formed between the south coast of Vancouver Island and the mainland of the State of Washington. The breadth of the Strait between Cape Flattery, its southern point of entrance, and Bonilla point on Vancouver Island is 13 miles. The breadth of the Strait for sixty miles easterly averages 12 miles.

At its eastern part are channels leading in or outwards between Vancouver Island and the mainland of British Coulmbia and among the Haro archipelago, and southward to the coast

of the United States, by Admiralty inlet and Puget Sound.

The Strait along the southern part of Vancouver Island contains several inlets in which harbours are located. The most important of these harbours are Victoria and Esquimalt.

Victoria Harbour.

Victoria harbour has its entrance between Ogden and Maclaughin points. The entrance to the harbour is shoal, narrow and intricate, but there is sufficient depth of water for ocean-going vessels to enter the outer harbour and berth at two wharfs called the ocean docks, where the general depth of water is 33 feet at low water, except at one place where it is 26 feet at low water. Vessels calling at Victoria for orders or cargo, are not recommended to anchor off the entrance of the harbour owing to the exposed position, but good anchorage will be found during the summer months in the Royal Roads, with from 12 to 20 fathoms of water, and good holding ground, and in winter Esquimalt harbour, about two miles distant from Victoria harbour, affords good anchorage and shelter in from 5 to 8 fathoms, with mud bottom.

Vessels drawing from 14 to 15 feet or thereabouts, may enter Victoria harbour between Beren's island and Shoal point, in a channel of about 400 feet in width with a depth of 17 feet at low water. At high tide vessels drawing 17 feet may enter the inner harbour. After passing Laurel point the harbour expands into what is named James bay, which is well sheltered and vessels lie with safety at the wharfs along the city.

The wharfs in Victoria are divided into three groups; the outer wharfs, sometimes called the ocean docks, are used by ocean-going steamers.

The lights are: one on Brotchie ledge, with a fog alarm, at the entrance to Victoria harbour

Canadian Pacific Ry. Co.—S. S. "Princess Charlotte"—Vancouver, Victoria and Seattle route.

in latitude 48° 24′ 20″, longitude 123° 23′ 40″; one on Beren's island, western entrance to harbour; one on Shoal point in Victoria harbour; one on Middle rock, Victoria harbour; one on Laurel point, Victoria harbour; one on Trial islands, and one on Discovery island, the two last on the route to Burrard inlet. Fisgard light is at the western entrance to Esquimalt harbour, and one on Race rocks in the Strait of Juan de Fuca has a powerful fog alarm.

Esquimalt.

Large vessels are repaired at Esquimalt where there is a graving dock 450 feet long over all and 430 feet on the blocks, 65 feet wide at the entrance and 26½ feet of water over the sill at high water, ordinary spring tides. The dock is closed by a caisson which gives an additional length of 30 feet. There is also a marine slipway capable of hauling out a vessel of 2,500 tons at Esquimalt, sheer legs to lift 25 tons, and forgings and castings are made there.

The route generally taken from Victoria to Vancouver is south of Trial and Discovery islands through the main channel of Haro strait, and northward of Stuart and Waldron islands into the strait of Georgia. The Fraser river empties into this Strait and in its freedom from risk of life and shipwreck, it possesses advantages over any other river on the coast. A sheltered strait, scarcely 15 miles across, receives its waters; the island of Vancouver serves as a natural breakwater, preventing the possibility of any sea arising which would prove dangerous to vessels even of the smallest class.

New Westminster stands on the North or right bank of Fraser river, just above the junction of North Fork, and 15 miles in a general northeasterly direction from the entrance proper. It occupies a commanding and well chosen position, being within easy distance of the entrance, and having great facilities for wharfage along its water frontage, a good depth of water, and excellent anchorage. A brief description of the Fraser river to its sources is given elsewhere.

Vancouver Harbour.

Vancouver harbour, British Columbia, is within Burrard inlet. This inlet is between Grey point on the south and Atkinson point on the north. Burrard inlet is easy of access to steamers and vessels of any size

C. P. R. Co.'s S. S. "Princess Alice"—Latest addition to B. C. coast service—Burns coal or oil.

or class. Good anchorage is found in almost any part. English bay is the outer anchorage, Vancouver harbour and Port Moody being inside what is called the first narrows. The depth of water in English bay is from 5 to 9 fathoms and the channel entering False creek is from ½ to 1 fathom at low water; the spring tides rise 13 feet and the neap tides 11 feet. False creek is used by light draft vessels only. Two mooring buoys have been placed, one on each side of the entrance in sufficient depth of water to allow tugs and barges to remain when the tide is falling, and to pass into the creek when the tide is rising or at high water. In the first narrows, entering Vancouver harbour the width of the channel is about one cable, the depth of water is from 10 to 17 fathoms as far in as Prospect bluff on the south side, and from 6½ to 8 fathoms between Prospect bluff and Brockton point. The tide runs from 4 to 8 knots in the narrowest part of the narrows. Parthia shoal lies in mid-channel, north-westward of Brockton point, with least depth of water of 3½ fathoms and deep water on each side of the shoal. Burnaby shoal is the only real danger at the entrance and has 1½ fathoms on its shallowest part in low water; these shoals are buoyed to mark them. Inside the narrows the harbour is a fine, capacious and secure one. The depth of water within the harbour is from 5½ fathoms in the vicinity of the wharfs to 36 fathoms in mid-harbour at low water, opposite the city. The spring tides rise 13 feet and neap tides 11 feet. The second narrows above Hastings village has a depth of water of from

Canadian Pacific Railway Company—Beacon Hill Park, Victoria, B.C.

10 to 16 fathoms at low water, and vessels pass up to Port Moody, a snug harbour having a depth of 4 to 6 fathoms at low water. The wharf accommodation at Vancouver is good.

The lights are Prospect point light at the entrance of the first narrows in latitude 49° 18′ 34″, longitude 123° 8′, with a bell; Brockton point light inside the narrows, also with a bell; Point Atkinson light, entrance to English bay, where there is a steam horn. A bell buoy is placed at Grey point and one on Spanish bank.

		Miles.
Distances from Vancouver to	San Francisco	840
" "	Honolulu	2,419
" "	Salina Gray	3,054
" "	Sitka	808
" "	St. Paul	1,266
" "	Dutch Harbour	1,726
" "	Yokohama	4,280
" "	Kobe	4,630
" "	Magasaki	5,028
" "	Shanghai	5,230
" "	Hong Kong	5,800
" "	Auckland	6,205
" "	Sydney	6,848

The Strait of Georgia.

The strait of Georgia may throughout be said to measure some 60 miles in length, and on both the southern and northern shores of Vancouver island and mainland shores shelter can be found every where. On the south shore lies Nanaimo, Ladysmith, Departure bay and Oyster harbour.

Nanaimo Harbour.

Nanaimo harbour is in latitude 49° 10′ N., longitude 123° 57′ W., on the eastern side of Vancouver island and is entered between lighthouse and Gabriola island. The immediate entrance to Nanaimo harbour is between Gallows point, Protection island on the north, and the mud bank formed by the silt from the Nanaimo river. Two channels lead to the wharfs, one called the north channel, north of the middle bank in the centre of the harbour, and the other called the south channel, south of the bank. The depth of water in each channel is

from 38 to 40 feet each side of middle bank, gradually decreasing as the shore and wharfs are approached. The north channel leads to the anchorage ground off the town, where there is 5 fathoms of water and mud bottom. Vessels also anchor outside Gallows point in 10 to 15 fathoms of water. The harbour affords safe anchorage, being well protected from winds from all quarters. Departure bay is also part of the harbour and is connected by Exit channel, a stretch of water 1¼ miles long and about one cable in breadth, with a depth of 14 feet at low water. The entrance from the Gulf of Georgia to Departure bay is between Boulder point, a steep cliff on the north end of Newcastle island and Jess island, a small island to the northward of Newcastle island. Departure bay affords room for a large number of vessels to anchor in from 18 to 25 fathoms of water. The tides in the harbour are very irregular and springs rise approximately 10 feet.

The large wharfs in the harbour are used for shipping coal, the main exports of the port. In addition to full cargoes many steamers get bunker coal.

Chemainus, now the seat of one of the wealthiest lumber industries in British Columbia is a well sheltered bay two-thirds of a mile in length by one in breadth.

Queen Charlotte Sound.

From the strait of Georgia to Queen Charlotte sound there is deep water everywhere. Seymour Narrows in Discovery passage is but three quarters of a mile in width and steamers have sometimes to wait for tides, but for the one hundred and fifty odd

Canadian Pacific Ry. Co.—East portion of docks and railway yards, Vancouver, B.C.

miles from Vancouver to Queen Charlotte sound, the route is not only well sheltered but is perfectly safe in every other way.

It will be of interest here to give a little data about the most important inlets from Burrard inlet to Prince Rupert.

Howe Sound.

Howe sound, immediately adjoining the former, is an extensive sheet of water, the general depth being very great, while there are but few anchorages. The entrance, nearly 12 miles in width, is between point Atkinson, the north point of Burrard inlet and Gower point.

Jervis Inlet.

In Malaspina strait, well protected by Texada island, is the entrance to Jervis inlet, one of the most remarkable arms of the sea which indent the continent of America from the parallel of Juan de Fuca strait as far as latitude 60° N., it extends by winding reaches in a northerly direction for more than 40 miles, while its width rarely exceeds 1½ miles, and in most places is even less.

Bute Inlet.

Bute inlet is the next extensive area of the sea to be found northward, it penetrates the mainland for nearly 40 miles in a winding course inland, and presents many similar features to Jervis inlet, the general breadth varying from one to two miles, as in Jervis inlet. On both shores are mountains rising abruptly to some 5,000 or 8,000, feet covered with snow all the year round. There are neither as many anchorages nor harbours as in the former but the depths are greater.

Knight Inlet.

The main entrance, though rarely used on account of rocks, to Knight inlet which is one of the most extensive of sea canals of British Columbia, lies northward of Swanson, Lewis and Village islands. From thence, Fitzhugh sound, Millbank sound and Laredo sound are important inlets navigable with very deep water. Greenville channel still farther north leads to Prince Rupert in Chatham sound.

Prince Rupert harbour is entered from Graham sound by vessels from the north,

Port Essington, B.C.—A cannery on the Skeena.

Lighthouse and buoy depot—Prince Rupert.

Prince Rupert.

between Kinnahan islands and Lima point, the extreme south point of Digby island, and from the south by Grenville channel, Arthur passage and Malacca passage inside channels and by Hecate strait on the outside. The depth of water in the course which vessels from the north take at the entrance, is from 21 to 29 fathoms, and the least depth at low water is 14 fathoms southwest of Georgia rock which is buoyed with a gas buoy. The course from the south to the entrance is from 20 to 25 fathoms deep. The northern entrance is about 1½ miles wide between Lima point and the Kinnahan islands. The width between Digby island and Kaian island about the same distance when the entrance to the north, narrows until it reaches Casey point, on the west shore of Kaian island, where the width is about a half a mile. At Parizeau point, on the same shore, the entrance widens to half a mile. At Pilsbury point on the same side, the entrance expands to about a mile and continues this width for some distance along the front of the town. The water north and east of the town is about 20 fathoms deep, and opposite the town, from 23 to 17 fathoms in the channel and about 6 fathoms alongside the wharf.

The wharf at Prince Rupert is about 1,500 feet along the water front, with two sheds on it. The anchorage in the harbour is good for vessels of any size and draught. Range lights are placed on Coast island in line with the course used by vessels from the north. These lights are in latitude 54° 12′ 43″, longitude 130° 19′ 53″. Acetylene buoys are located near Georgia

rock, Spire ledge, Barrett rock, Holland island and Casey point. These buoys show flashing lights. A lighthouse tower is situated on the west side of the northernmost island of Lawyer islands in Malacca passage, latitude 54° 6′ 58″, longitude 130° 20′ 47″.

At Prince Rupert a Dominion lighthouse and buoy depot has recently been completed by the Department of Marine and Fisheries.

The depot is for the service in the northern waters of British Columbia and is located on Digby island, which, with Kaian island and mainland forms the harbour of Prince Rupert.

The site contains about 6 acres on the shore of Casey cove, perfectly protected from all storms. It is built in terraces on the upper of which are residences for the officer in charge and the staff. From the site of the residences is a drop of 3 feet to level of road and office buildings. Then comes a further drop of 11 feet to the level of the big yard in which are situated the stores for carbide, oil and general supplies. The power house containing an electric light plant, pumps and machinery and also buoy shed, 80 ft. x 40 ft. with a 20 ton travelling crane for handling the buoys.

Track is laid between the various buildings and along the trestle to the wharf of reinforced concrete. The wharf is 400 feet by 40 feet and has a depth of water, at low tide, of 18 feet.

	MILES.
Distances from Prince Rupert to Yokohama	3,800
" " " Kobe	4,150
" " " Magasaki	4,530
" " " Shanghai	4,750
" " " Hong Kong	5,320

Lighthouse and buoy depot, Prince Rupert, recently completed.

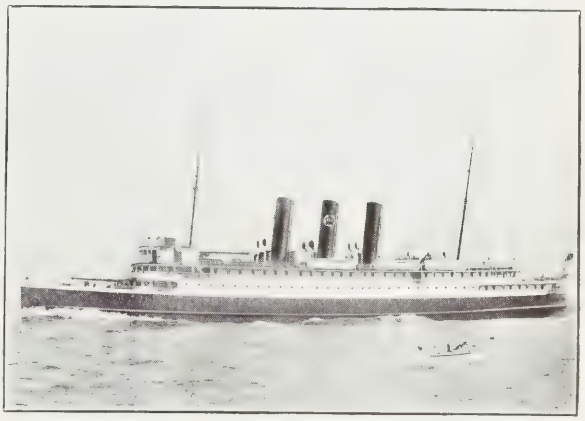
North of Prince Rupert is Port Simpson, one of the best harbours on the coast, protected from all winds except west winds, which seldom blow. The harbour embraces an area of 4 square miles of water from 4 to 20 fathoms deep. The British Columbia coast continues some distance farther north in Chatham sound and includes the Dundas islands, Zayas and other islands. Dixon entrance, between Queen Charlotte islands and Prince of Wales island, is a broad entrance from the Pacific Ocean and merges into Browns Passage between Stephens and Melville islands. Very deep water is found in Dixon entrance until the contour line of the coast is reached. In Brown Passage it is not so deep but ranges from 16 to 126 fathoms in the passage to Chatham sound.

West of the inner channels described on the course between Vancouver and Prince Rupert, a number of large islands lie on the east coast

Lighthouse and buoy depot, Prince Rupert—Residence of the official in charge.

of Hecate strait. Hecate strait is a broad sheet of water between the Queen Charlotte islands and the mainland. Between north end of Vancouver Island and the southern of the Queen Charlotte islands, the waters of the Pacific ocean pass until they reach the coast of the mainland.

Vancouver Island and the Queen Charlotte islands, are indented by many bays and inlets on their eastern sides. The same can be said of the western coast from the most northern part of Graham island, of the Queen Charlotte islands, to the southern end of Vancouver Island or Juan de Fuca strait where this description began. An important sound 30 miles west of the entrance of the strait is Barkely sound. It is 14 miles wide and pratically retains this width, including islands, for a distance inland of 12 miles. The sound then breaks into numerous channels or canals, the principal one being Alberni canal that extends inland 23 miles. This canal so deeply indents Vancouver Island



Grand Trunk Pacific Railway, B.C. coast service—S. S. "Prince Rupert.

that only 13 miles of land remains between the head of the canal and the east coast of the Island.

Tides of the Pacific Coast.

The tide of the Pacific coast of Canada can best be described as a declination-tide. Its leading feature is a large diurnal inequality in time and height. There is also a large annual variation with the change in the declination of the sun. When the moon is farthest south or north of the equator, the inequality between the two tides of the day is greatest, and what is termed long and short runs of the current occur.

The tide on this coast is not only of direct interest to navigation, but also to several important industries, notably the lumber industry and coal trade which carry on their business to a large extent by towing. The fishing industry is also deeply interested in the tide, not only on the Fraser and Skeena rivers where numerous large canneries are

located, but also on the long natural channels and sheltered passages.

On the outer coast of Vancouver Island the tide has a rise of from 10 to 12 feet. Among the islands of the Gulf of Georgia and in the strait, the mean rise is 12 to 13 feet. At Port Essington on the Skeena river the rise at the springs is 21 feet while Port Simpson has 19 feet, and Prince Rupert, the terminal of the Grand Trunk Pacific, 5% more. The range of the tide at the head of the long inlets or channels is only 2 to 12 per cent. greater than at their mouth, while the time of high and low water is practically the same.

One difficulty met with in navigation on the Pacific coast is the very strong tidal currents in the various passes and narrows; so strong that in some of them navigation is only possible at slack water. The most important of these is the far-famed Seymour Narrows, where there is a current of 7 to 12 knots. The Yuculta, largely used by tugs in towing logs, has a current almost as strong. In Active and Porlier passes on the route from Vancouver to Victoria the current runs from 5 to 7 knots.

As these passes can only be navigated at slack water, except by vessels of high speed, the time of the turn of the current is important. In this connection the Tidal and Current Survey include in their Tide Tables the time of slack water in these passes and narrows, based upon observations obtained at each locality.

Tide gauges are kept in continuous operation at Clayoquot, on the west coast of Vancouver Island, Victoria, Vancouver, Prince Rupert and Port Simpson.

The Tide Tables issued by this Survey are published in two sets, one including the harbours of Eastern Canada and the other those on the Pacific coast; and besides giving the time of the tide at the principal harbours, these tables give a series of "differences" by which the time of high and low water at intermediate ports can be readily and accurately determined.

PRINCIPAL NORTHERN WATERS.

Hudson bay, not including James bay, has a length of 500 miles and a width of 500 miles. Hudson strait, from Button islands to the west coast of Mansfield island, is 480 miles long. Roughly speaking, from the Atlantic ocean, through the strait, and across the bay to Churchhill, the distance is 1,000 miles. The width of the strait is from 30 to 40 miles at the entrance between Button islands and Resolution island; farther west the width is 84 miles, and at the western end of the strait, 70 miles.

Frobisher bay, on the east side of Baffin island, is 150 miles deep with an average width of 30 miles.

Cumberland gulf is 170 miles deep by an average width of 40 miles.

Lancaster Sound is about 1,000 miles long from east to west, with an average width of 40 miles, and is the only northwest passage for deep-draught vessels.

Jones Sound, north of North Devon island, is about 300 miles long by about 30 miles wide.

Intercolonial Railway—The harbour of St. John.

AIDS TO NAVIGATION MAINTAINED BY THE DOMINION OF CANADA.

The aids to navigation in Canadian waters are established and maintained by the Department of Marine and Fisheries. They consist of hydrographic surveys and charts, lighthouses, pole lights, concrete beacon sand day beacons lighted and unlighted, and including acetylene lighted buoys, combined lighted acetylene and warning buoys, automatic whistling and bell buoys conical and tubular buoys of large size, spar buoys and buoys of various shapes and sizes. Other aids are lightships, submarine warning stations, wireless telegraphy stations, land telegraph stations, signal stations of several kinds, storm warning stations, meteorological stations and magnetic observatories, time balls, ice-breaking steamers, tide gauges, tide tables, tidal currents reports, coast pilots with sailing directions, notices to mariners and life-saving stations. Quarantine stations and marine hospitals are also maintained.

The lighthouses have distinctive characteristics, viz.: fixed ights, revolving lights and flash lights. Two systems are used, dioptric or lense lights and catoptric or reflector lights. Dioptric lights have in most localities been substituted for catoptric lights. The work of substituting dioptric for catoptric lights is being carried on continuously.

LIGHTHOUSE IMPROVEMENTS.

The subject of lighthouse illumination has, in recent years, received special and most careful attention. The installation of more powerful lights at many of the most important stations along the Atlantic and Pacific coasts, the Gulf and River St. Lawrence, Bay of Fundy and Great Lakes, made it necessary for the department to build more expensive and a better class of towers. The greater weight and size of the new lanterns required more stable structures, where new towers were erected, and the strengthening and raising of old towers. It was imperative to guard against vibration as far as possible, and this led to the more extensive use of masonry and the introduction of concrete reinforced with steel, instead of wooden structures.

Cape Race tower was the first reinforced concrete tower and supports one of the largest lanterns produced by Messrs. Chance Bros. and Co., of Birmingham, England. The light is elevated 165 feet above high water mark, and the lantern is 17 feet $1\frac{1}{4}$ inches in diameter, having an illuminator or mantle 85 millimeters in diameter. It is fitted with the incandescent vapour oil system and has a hyper-radial single flashing apparatus of 1,330 m.m. focal distance,

Reinforced concrete tower with flying buttresses, well-known type of Canadian lighthouses.

"Lillooet," Canadian hydrographic survey steamer, British Columbia.

consisting of four panels of 90 degrees horizontal angle. The light is also floated on mercury and operated by clock work mechanism, the flash occurring every five seconds with an interval of darkness. The light should be seen nineteen miles at sea but has been observed at a much greater distance. It is classed amongst the most powerful of lights, the candle power being 1,000,000 candles.

The changes in lights consist of replacing old-fashioned lanterns by new and modern ones, with incandescent mantle burners and vapourized oil as the source of light; other changes are being made by replacing some lights by others of greater magnitude having the same kind of optical apparatus, but with more distinctive features. Acetylene as an illuminant, from calcium carbide, has been largely introduced in unwatched towers and beacons. It is used entirely in the lighted buoys of Canada.

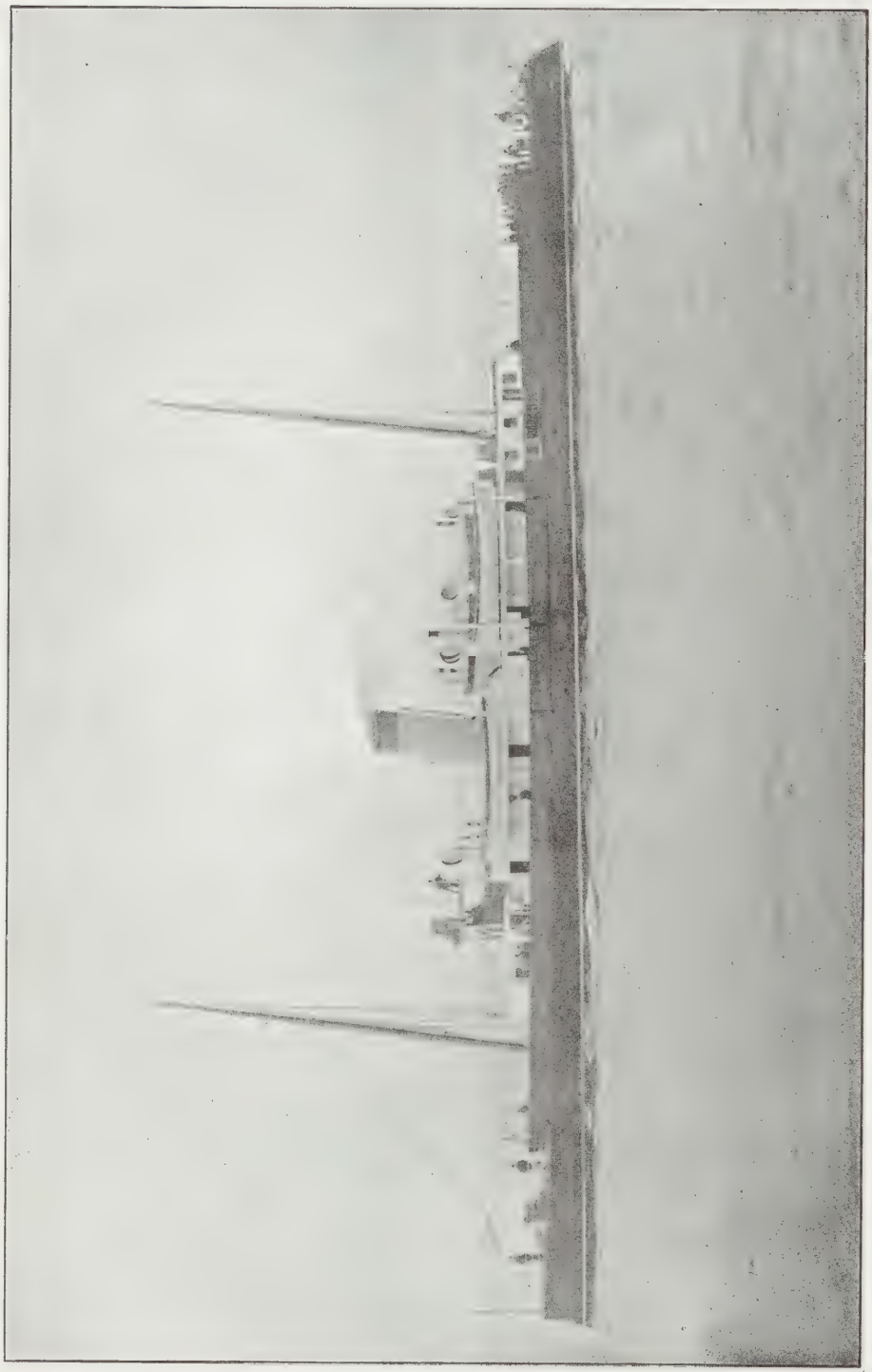
The following table may form an interesting study for the mariner who is constantly called upon to make comparisons between lights and to note their distinctive character:—

APPROXIMATE candle power of dioptric flashing apparatus used in Canadian lighthouses.

Order.	Character.	Burner used.	Candle power
Hyper-radial	Single flashing	85 m.m. vapour	1,000,000
First	" "	85 "	450,000
"	Double "	85 "	450,000
"	Triple "	85 "	240,000
"	Quadruple	85 "	160,000
Second	Single "	85 "	270,000
"	Double "	85 "	270,000
"	Triple "	85 "	135,000
"	Quadruple	85 "	95,000
Third	Single "	55 "	100,000
"	Double "	55 "	100,000
"	Triple "	55 "	55,000
"	Quadruple	55 "	40,000
"	Single "	small 55 "	60,000
"	Double "	55 "	60,000
"	Triple "	55 "	35,000
"	Quadruple	55 "	25,000
Fourth	Single "	35 "	25,000
"	Double "	35 "	25,000
"	Triple "	35 "	15,000
"	Quadruple	35 "	11,000

Catoptric revolving lights have a power of less than 5,000 c.p. By substituting an oil vapour

Three lightships in tow of C. G. steamer "Druid."



Canadian armed fishery cruiser "Canada"—Speed, 22 miles an hour—Armament 4 automatic quick-firing guns—Built by Vickers Sons & Maxim, England.

burner for a circular wick burner of same diameter, the power of an apparatus is increased about three and one-half times.

The light stations of the department now number about one thousand, and about twelve hundred separate lights are shown from lighthouses.

NATURE OF TYPES OF IMPROVED AIDS TO NAVIGATION.

The nature of the improved types of aids to navigation will be interesting to mariners, shipowners, insurance companies and others concerned in shipping.

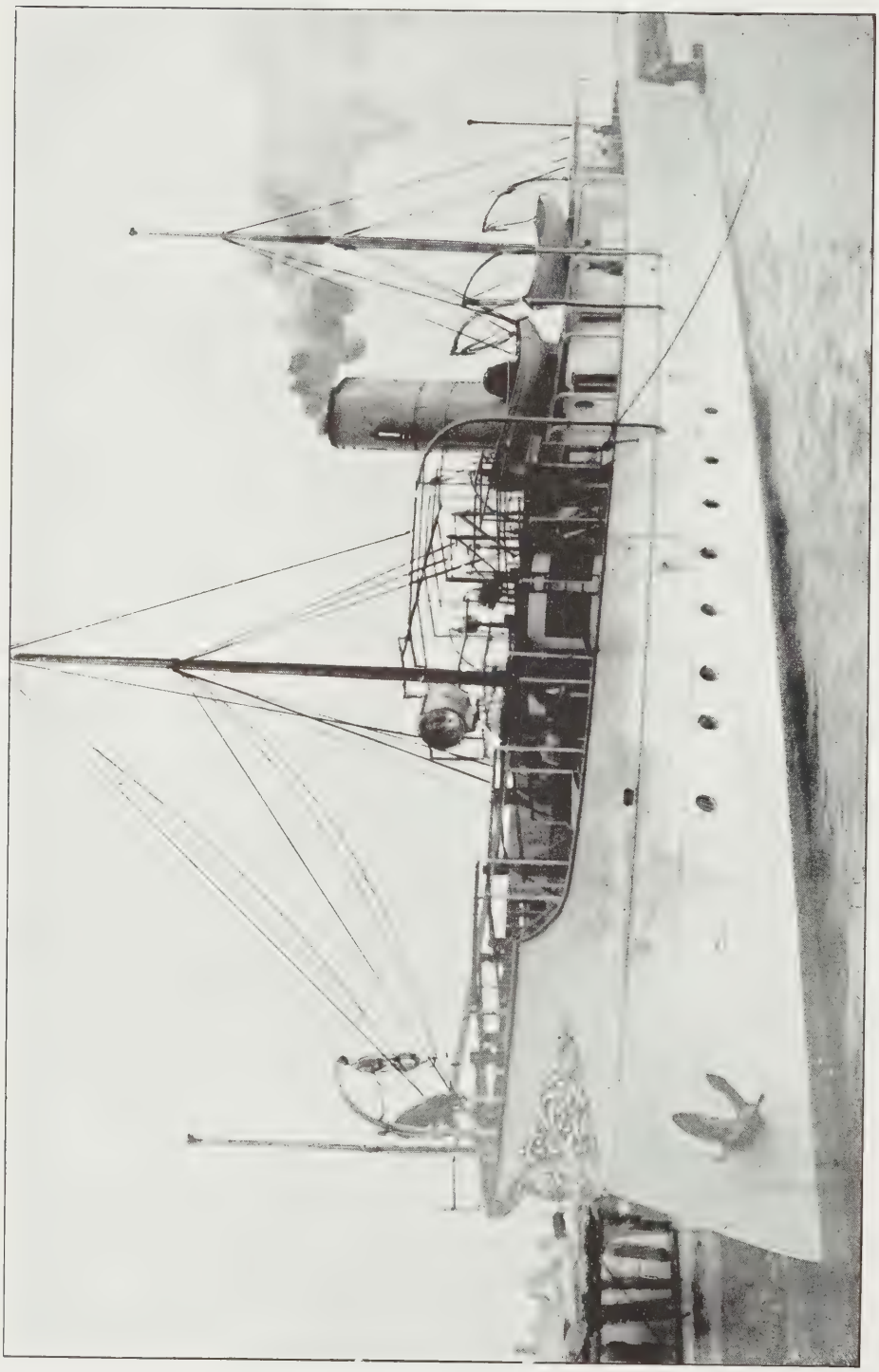
Diaphone.

The diaphone has proven in Canadian waters to be superior to the siren or explosive fog signals, though very much smaller in size and weight than the Scotch siren. The experience of the Marine Department with compressed air horns, steam whistles and explosive fog alarms was unsatisfactory. The Scotch siren which had been in use in Great Britain and considered the most effective sounding instrument at one time, was adopted at two of the most important stations on the Atlantic coast and the St. Lawrence river. The compressed air horn gave surprisingly good results in calm weather, but did not force the sound through external noises with any degree of reliability, in thick or stormy weather.

Ice-breaking steamers at Port Arthur.

In the year 1903, the diaphone was recommended to the department as the best known invention for producing signal warnings and neither cumbersome nor heavy, compared with the siren and its plant.

Steamers "Lady Grey" and "Montcalm," ice-breakers, at Cap Rouge



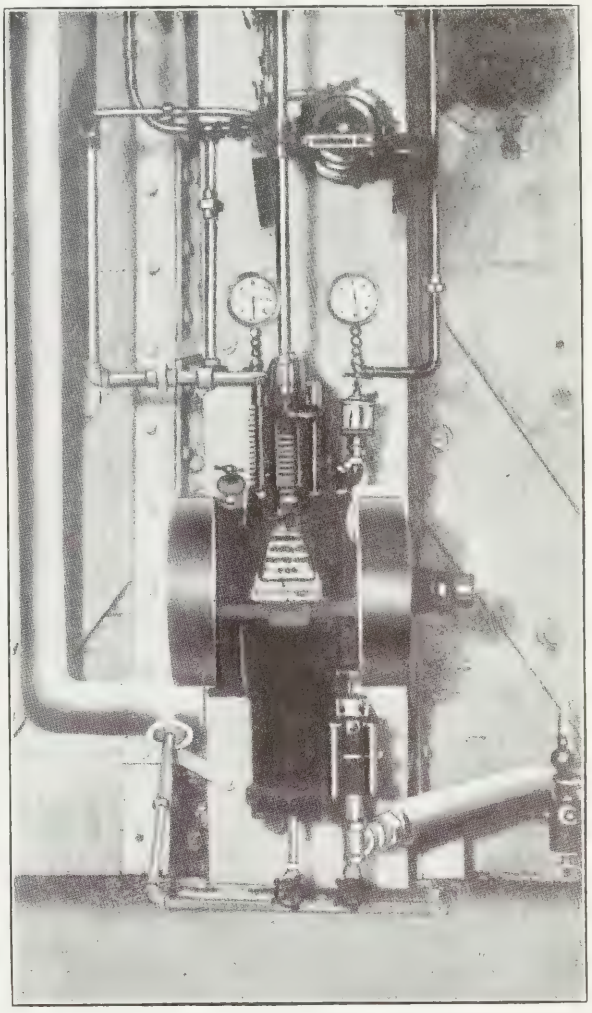
Canadian armed fishery cruiser "Vigilant"—Speed, 22 miles an hour—Armament, 4 quick-firing guns—Built by Polson, Toronto.

A trial of a small diaphone of 87 pounds weight alongside of a siren which, with its horn weighed 9,280 pounds, showed that the diaphone could be heard at a greater distance. The siren operated by $14\frac{1}{2}$ horse-power, was heard $5\frac{3}{4}$ miles from the station, the diaphone was heard $6\frac{1}{4}$ miles, but only required $1\frac{1}{4}$ horse-power to operate it.

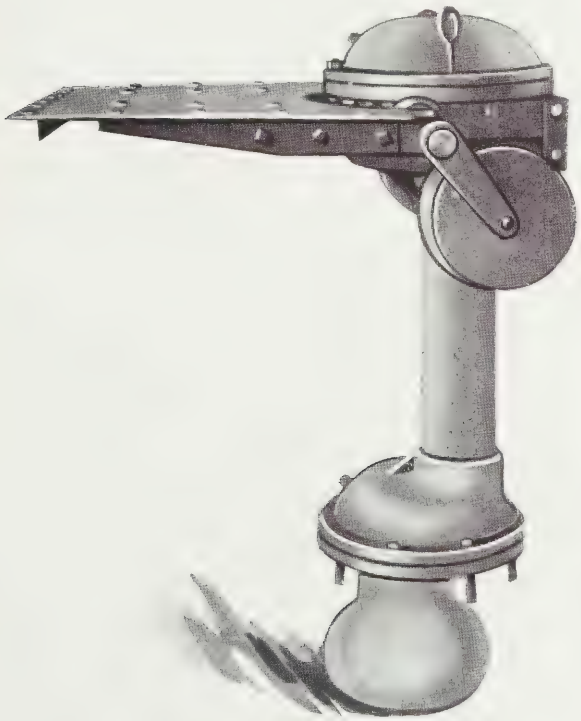
The superiority of the diaphone was shown in every respect, taking up less space and being operated at much less expense. The use of the diaphone has proved that it is less likely to get out of order than other aerial signals and not so liable to uncertainty of sound, owing to its evenness of pitch.

The diaphone has been developed, until it has reached a greater state of efficiency and perfection than when first introduced by the department. Its operations are carefully noted by the departmental officers, and, it has been ascertained that the notes are distinguishable from the noises made by the sea on ledges and shoals, and by wind on the sea. The same results were not obtained, in all cases, with the siren and explosives.

Acting upon the discovery of the superiority of the diaphone, the department replaced a large number of other fog signals by the diaphone and is continuing to establish, at other points, this type of warning.



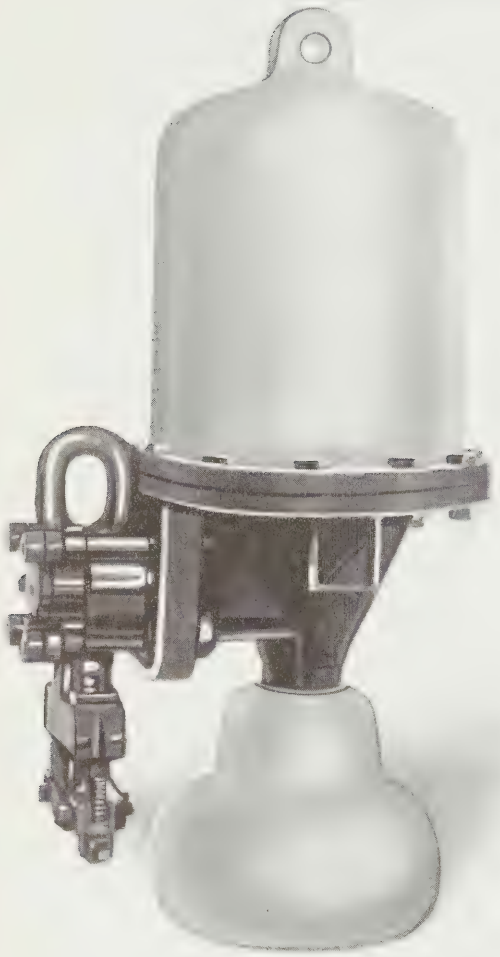
Air compressor and pneumatic code-ringer.



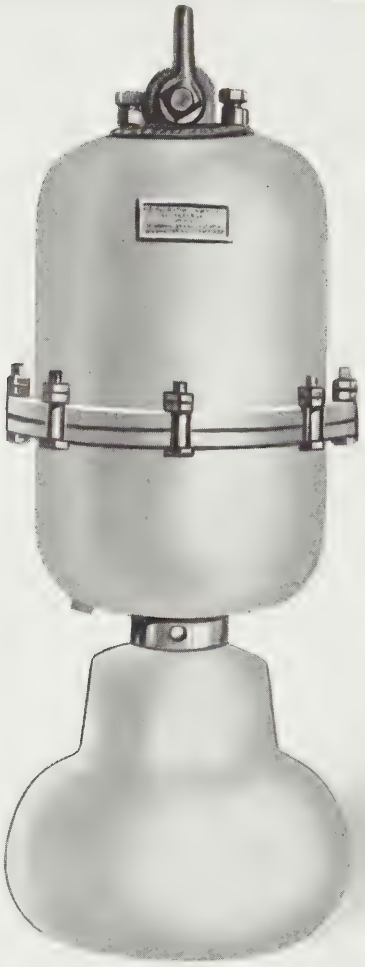
Submarine warning bell detached from bottom of buoy.

About eighty-two diaphones are now in use in the Dominion of Canada, varying from $1\frac{1}{2}$-inch to 5-inch diaphones, and several more will be put in operation before the end of the season of navigation of 1912, which will make the total number established and to be operated in the near future, about ninety. The stations are located in the main waterways of Canada. The other fog alarms of the Dominion consist of a small number of sirens and a number of fog horns, operated by steam.

The difficulties attending navigation in the Bay of Fundy on account of frequent fogs, have

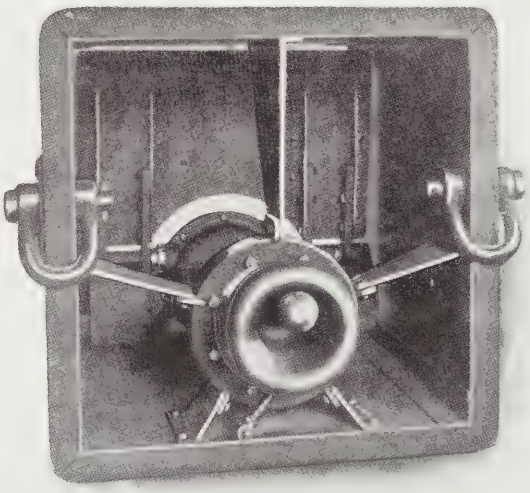


Electric submarine bell.



Pneumatic submarine bell.

Direction Indicator Box.



Bell buoy submarine attachment bolted in place on bottom of buoy.

been largely overcome by the aid of the diaphone. The establishment of fog alarms or warnings are indispensable; vessels are never out of range of sound of these instruments, from the entrance of the bay until the harbour of St. John is reached.

COMBINED LIGHTED AND WARNING BUOYS.

In addition to improving the fog and thick weather warnings established on land, low pressure acetylene buoys, combination acetylene light and whistling buoys and combination acetylene lighted and bell buoys have been introduced. These buoys are known as the Willson buoys and are manufactured by the International Marine Signal Company, Limited, of Ottawa.

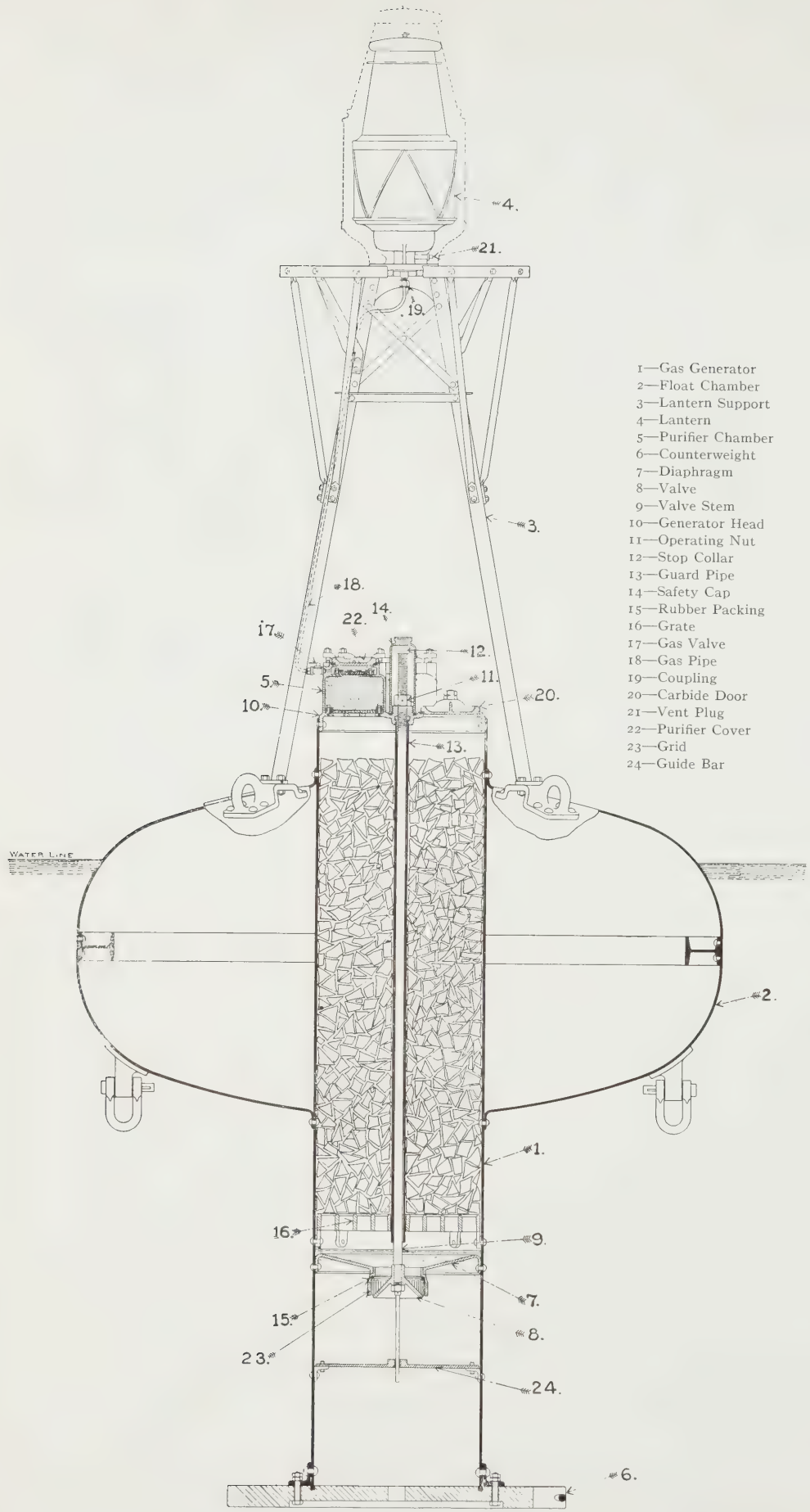
Acetylene Buoys.

The whistling device of the combination buoy is an improvement on the old type on account of the increased area of the compression tube, the increase being from $4\frac{1}{2}$ square feet in the Courtenay whistling buoy to 7 feet and 25 feet in the combination gas and whistling buoy. This combination buoy is equipped for receiving the standard automatic submarine bell apparatus, which conducts the sound of the bell by water to vessels equipped with receivers.

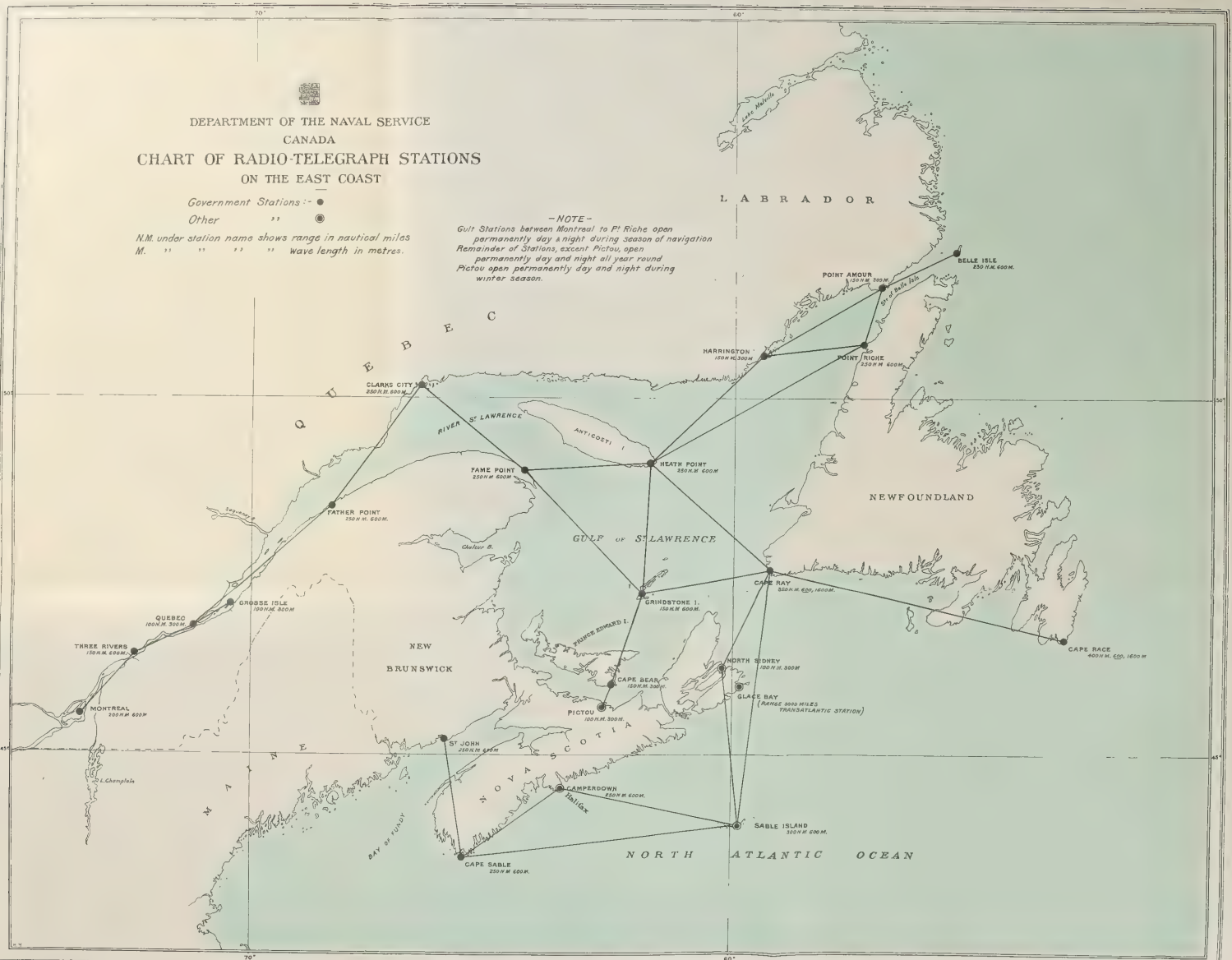
Acetylene from calcium carbide is used in these buoys. The largest size lanterns made for gas buoys, show a light of from 825 to 1,063 candle power and with the sounding power so great, that the combined buoys constitute a floating aid to navigation comparable to a lightship. The greater efficiency of these buoys has only been arrived at by careful observation of the defects of the automatic buoys formerly in use, and step by step have the improvements been thought out and adopted. It was not until the superiority of the acetylene buoy as now constructed, with low pressure gas, generated directly from calcium carbide in the buoy, was beyond dispute, that the combined buoys were adopted and, as they mark dangers by being placed outside the danger itself instead of being located on shore, they are indisputably a very valuable aid in navigating our waters. Thirty-eight of the combined automatic buoys have been placed to mark dangers along the coast of Nova Scotia from the eastern part of Cape Breton, and continued to St. John, N.B., in the Bay of Fundy. Several of this class of buoy have been placed in the gulf and lower St. St. Lawrence river and upper St. Lawrence and Great Lakes, whilst a number have been located where most needed in British Columbia, making a total of sixty-two. Some of these buoys placed in the maritime provinces have the lantern thirty feet from the water and therefore the light can be seen at a great distance.

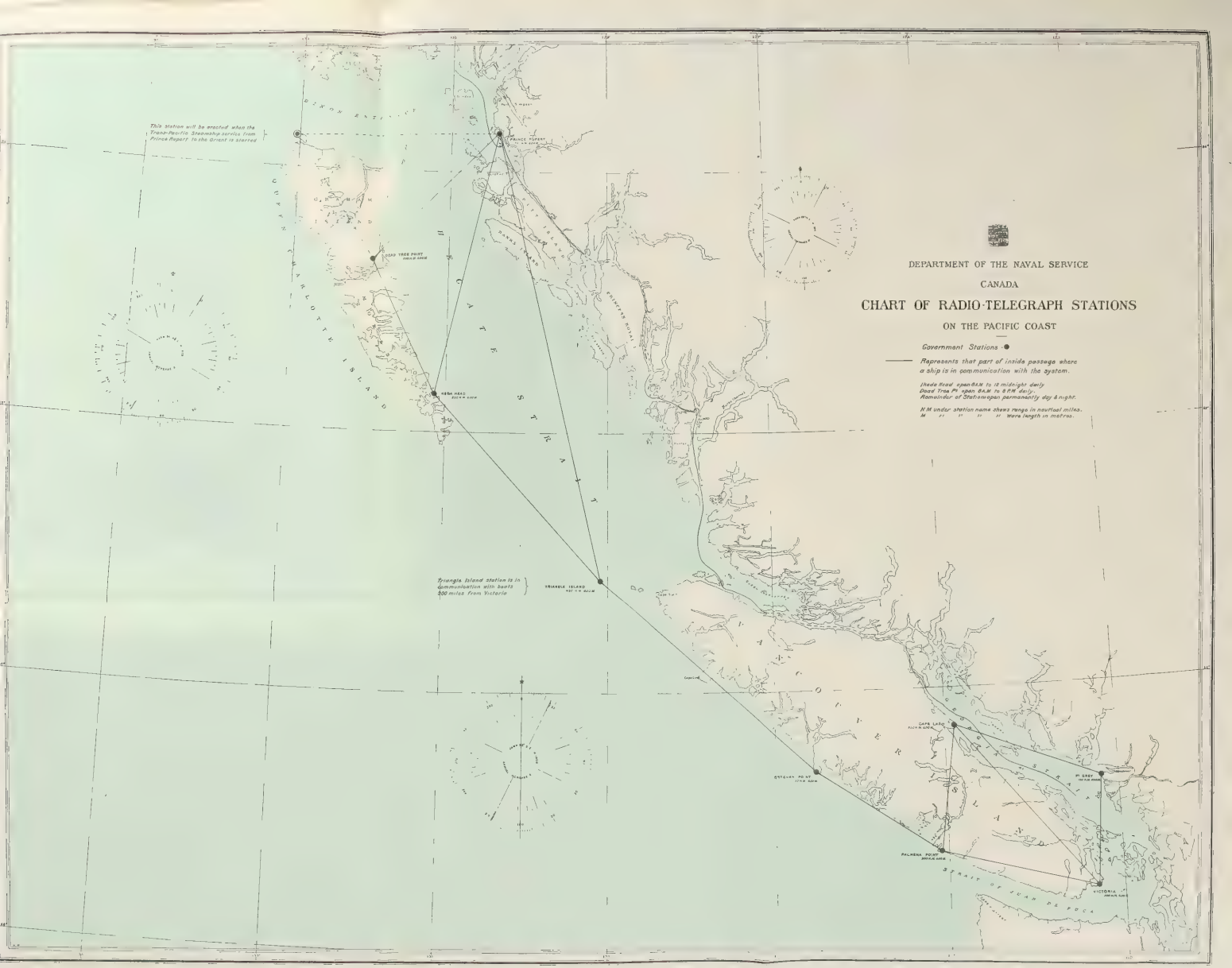
Gas and whistling buoy, Nova Scotia Coast.

Beacon—British Columbia.



Automatic acetylene gas buoy


DEPARTMENT OF THE NAVAL SERVICE
CANADA
CHART OF RADIO-TELEGRAPH STATIONS
ON THE EAST COAST
Government Stations :- ●
Other " ◉
N.M. under station name shows range in nautical miles
M. " " " " " Wave length in metres.
-NOTE-
Gulf Stations between Montreal to Pt Riche open permanently day & night during season of navigation
Remainder of Stations, except Pictou, open permanently day and night all year round
Pictou open permanently day and night during winter season.
LABRADOR
QUEBEC
NEWFOUNDLAND
NEW BRUNSWICK
NOVA SCOTIA
MAINE
GULF OF St LAWRENCE
NORTH ATLANTIC OCEAN
RIVER St LAWRENCE
ANTICOSTI I.
BAY OF FUNDY
Lake Melville
St of Belle Isle
Seguenay
Chaleur B.
L. Champlain
BELLE ISLE 250 N.M. 600 M.
POINT AMOUR 150 N.M. 300 M.
HARRINGTON 100 N.M. 300 M.
POINT RICHE 250 N.M. 600 M.
CLARKS CITY 250 N.M. 600 M.
FAME POINT 250 N.M. 600 M.
HEATH POINT 250 N.M. 600 M.
FATHER POINT 250 N.M. 600 M.
GRINDSTONE I. 150 N.M. 600 M.
CAPE RAY 250 N.M. 600, 1600 M.
CAPE RACE 400 N.M. 600, 1600 M.
GROSSE ISLE 100 N.M. 300 M.
QUEBEC 100 N.M. 300 M.
THREE RIVERS 150 N.M. 600 M.
MONTREAL 100 N.M. 600 M.
CAPE BEAR 150 N.M. 300 M.
NORTH SYDNEY 100 N.M. 300 M.
GLACE BAY (RANGE 3000 MILES TRANSATLANTIC STATION)
PICTOU 100 N.M. 300 M.
St JOHN 250 N.M. 600 M.
CAMPERDOWN 250 N.M. 600 M.
HALIFAX
SABLE ISLAND 300 N.M. 600 M.
CAPE SABLE 250 N.M. 600 M.
70°
60°
50°
45°


DEPARTMENT OF THE NAVAL SERVICE
CANADA
CHART OF RADIO-TELEGRAPH STATIONS
ON THE PACIFIC COAST
Government Stations ●
Represents that part of inside passage where a ship is in communication with the system.
Ikeda Head open 8AM to 12 midnight daily
Dead Tree Pt open 8AM to 8 PM daily.
Remainder of Stations open permanently day & night.
N M under station name shews range in nautical miles.
M " " " " were length in metres.
This station will be erected when the Trans-Pacific Steamship service from Prince Rupert to the Orient is started
PRINCE RUPERT
DEAD TREE POINT
ESTEVAN POINT
CAPE LAZO
PT. GREY
PALMERA POINT
VICTORIA
TRIANGLE ISLAND
Triangle Island station is in communication with boats 300 miles from Victoria
QUEEN CHARLOTTE ISLANDS
HECATE STRAIT
QUEEN CHARLOTTE SOUND
GEORGIA STRAIT
STRAIT OF JUAN DE FUCA

The largest size combined buoy is 14 feet $6\frac{7}{8}$ inches maximum diameter; weight, 38,000 pounds when fully charged; draft, 26 feet 8 inches; total area of whistle tubes, 25 square feet; size of whistle, 18 inches; height of focal plane, 29 feet 7 inches; lantern, 500 m.m.; candle power, 1,063. The light can be seen under favourable circumstances twenty miles. With the occulting light, a full charge, say 3,500 pounds of carbide, should show a continuous light for nine months. The smaller combined gas and whistling buoy measures 9 feet $6\frac{3}{4}$ inches in diameter with the parts correspondingly smaller excepting the gas generator, which is large enough to contain 3,500 pounds of carbide.

As the subject here dealt with is the improved types of aids to navigation adopted by the department as distinct from the old types, it is pertinent to briefly and simply describe the construction and operation of the acetylene buoy. The buoys are of two shapes, one eliptical and the other cylindrical with the top of the body of the buoy forming a segment of a sphere. The gas generator is a tube of steel, placed vertically in the centre of the buoy and extending several feet below the body of the buoy, with a counterweight attached for the purpose of keeping the buoy upright. A grate is placed about one-third of the distance up from the counterweight, in the steel tube, and the calcium carbide crystals, size 4 by 8 inches, are put in at the top of the tube and rest upon the grate. The gas is generated by the water from beneath entering a hole in the counterweight and ascending to the grate in the tube. The gas when generated ascends through the carbide crystals to the purifier and from there to the lantern, by a small pipe. The light is shown by a cluster of flat flames with a round pilot flame to each flat flame, all surrounded by a Fresnel lens, giving to the lantern the property of throwing the light to a great distance. The lantern is supported by frame work of structural steel resting upon the body of the buoy. When gas is produced faster than the lantern consumes it, the pressure of gas being greater than water, forces the water away from the carbide and a temporary suspension of generation occurs during the time the gas is being consumed. The generation is resumed when the pressure of gas below stops and thus the automatic operation proceeds as long as the carbide lasts.

Canadian Government steamer "Lady Laurier," with cable laying apparatus.

Gas and whisling buoy—Known in marine circless as the "Outer automatic"—Halifax, Nova Scotia.

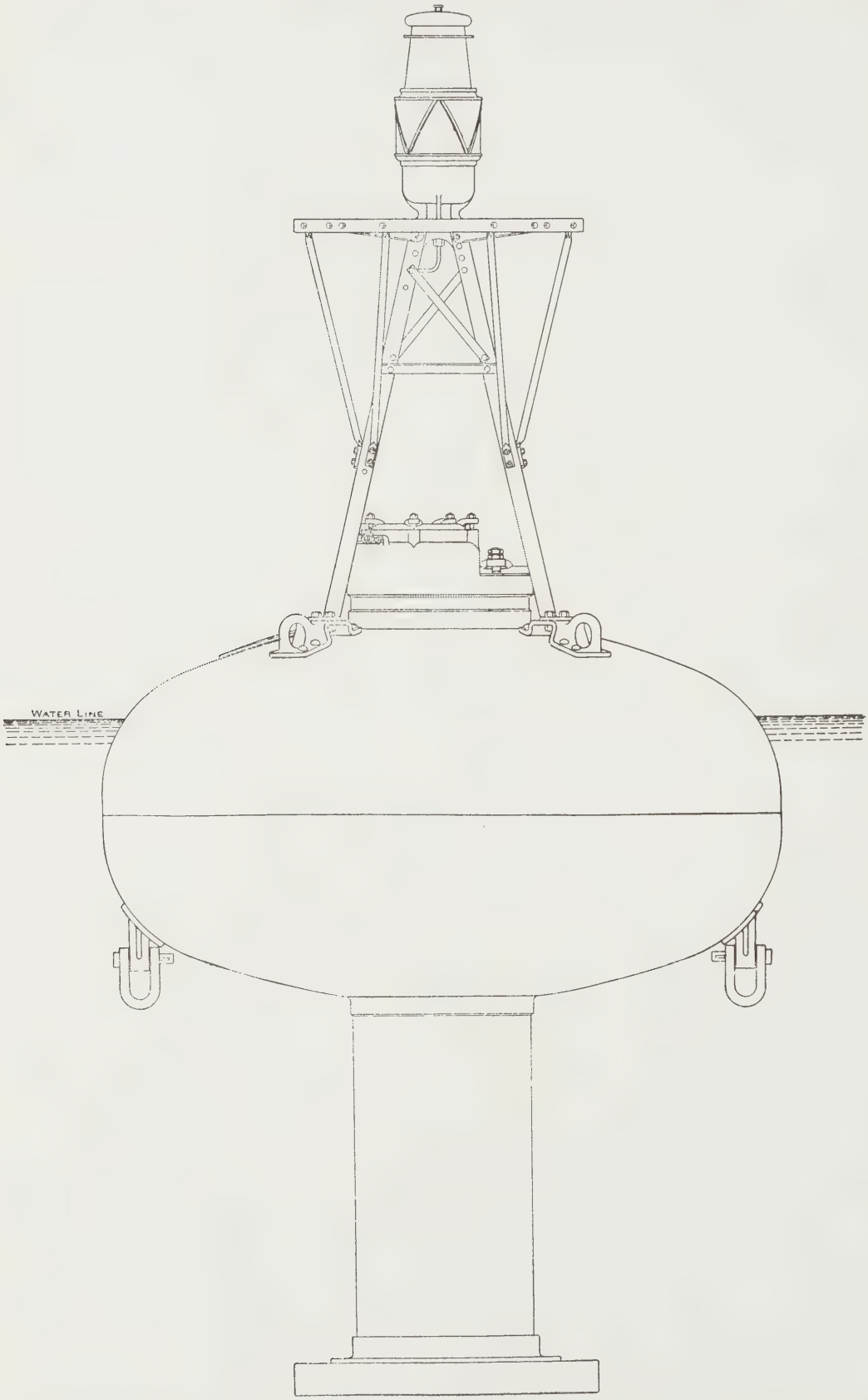
Steamer "Lady Grey" working in packed ice from three to four feet in thickness.

The ordinary Willson acetylene buoys are now made of three sizes: No. $7\frac{1}{2}$ B, 8 feet 6 inches diameter; carbide charge, 1,300; height of focal plane, 9 feet 10 inches; lantern, 200 m.m.; candle power 140, through a lens. With occulting light the charge is supposed to last six months. The other sizes are Nos. $8\frac{1}{2}$ B and No. $9\frac{1}{2}$ B with a somewhat larger diameter respectively than No. $7\frac{1}{2}$ B and showing more powerful lights. The charge of carbide for No. $9\frac{1}{2}$ B, weighs 3,500 pounds and is supposed to last nine months with occulting burners. The department has in use smaller sized gas buoys and intermediate sizes, but the above sizes are standard. About two hundred of the ordinary acetylene buoys have been placed on the coast, Great Lakes and in rivers.

WIRELESS TELEGRAPHY.

The wireless telegraph stations on the east and west coasts of the Dominion and St. Lawrence river now number twenty-one, and the establishment of a station at Montreal and one at Three Rivers in the St. Lawrence river, will afford additional aids to navigation in this great highway. The stations on the Atlantic coast are operated under the Marconi system, but at the Pacific coast stations, the Shoemaker system has been adopted. The latter system permits of inter-communication with vessels or stations having any other system of wireless telegraphy. The west coast stations have been well equipped and have been working satisfactorily.

Allusion has already been made to the adoption by the Canadian government of improved aids to navigation experimented with, for the first time, in Canadian waters. In connection with the introduction and adoption of the method of wireless telegraphy for communication with stations on land, the Department of Marine and Fisheries was among the first, if not the first, to enter into a contract with the



Automatic acetylene gas buoy

Marconi Wireless Telegraph Company for the erection and equipment of stations. The numerous messages which are now exchanged between ocean vessels and the stations in Canada, are daily proving the wisdom of continuing wireless telegraphy at sea and on our coasts. Some extraordinary instances of the value of this means of communicating the whereabouts of ocean liners, have been made known to the world. It is not, however, as generally known that one aid to navigation is dependent upon another to fix the position of a vessel in foggy or thick weather, when exact latitude and longitude are not known on board. When off the coast, for instance, vessels in distress, in the vicinity of a submarine warning station can tell by the distinctive sounds of the station the latitude and longitude and call to their aid other vessels by wireless telegraph. Having a knowledge of the approximate position to start with, the wireless telegraph can be used to bring assistance from vessels at sea or to communicate intelligence to the shore.

The important aid of our wireless stations has been recognized by the shipping interests generally, therefore up to date improvements in connection with them receive prompt consideration. On the Great Lakes the Department has lately erected four stations connecting Georgian Bay with Port Arthur, and already are the lake steamers being equipped with the necessary appliances for communication.

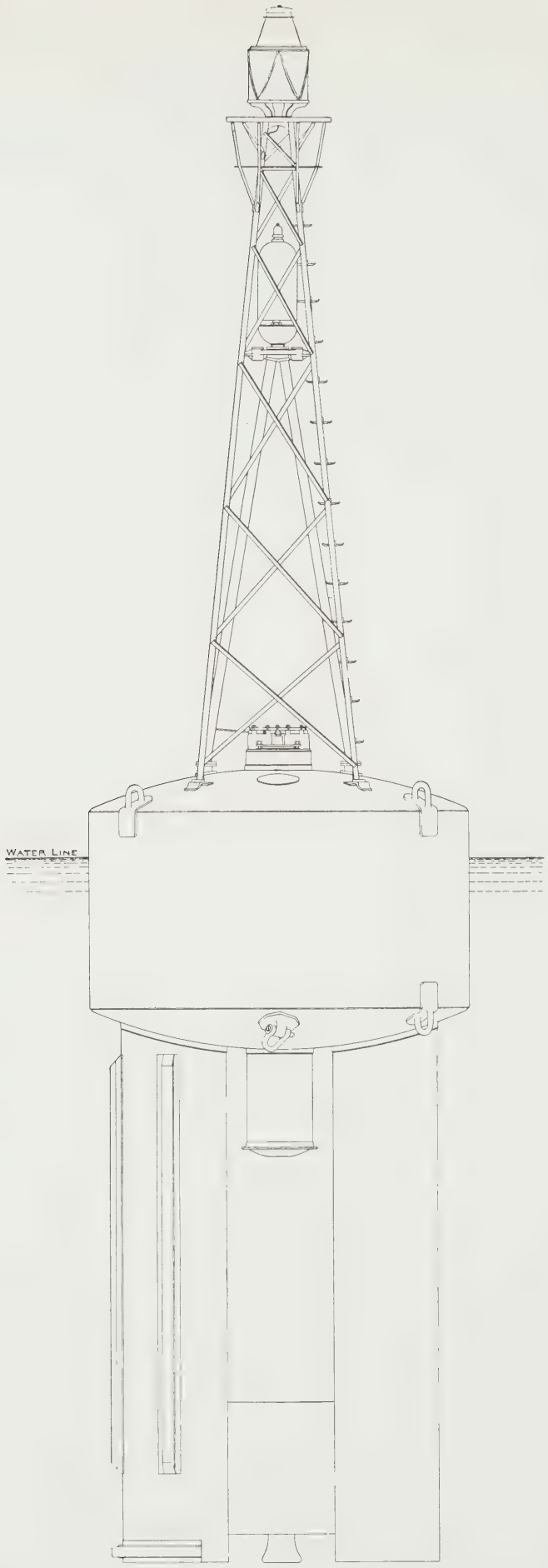
LIGHT STATIONS, LIGHTS, LIGHTSHIPS, FOG ALARMS AND GAS BUOYS, COMBINED GAS AND WARNING BUOYS.

For convenience, the list is made up of aids in the waters under separate districts of the Department.

In the maritime waters of New Brunswick, which include the Bay of Fundy, part of Northumberland strait, Chaleur bay and harbours of the province, are established 117 light stations, showing 147 lights. The fog alarms number 17, and one submarine warning station at Negro head in the Bay of Fundy. In addition there are gas and combined gas and whistling buoys, auto-matic unlighted whistling and bell buoys. Owing to the waters of New Brunswick and Nova Scotia being contiguous in the Bay of Fundy, the buoy service is included in one district. This district is No. 1, and in its waters are located 31 combined gas and whistling buoys, 6 combined gas and bell buoys and 15 gas buoys without warning apparatus and numerous unlighted steel and wooden buoys.

In Nova Scotia waters on the Atlantic coast, strait of Canso, Bay of Fundy, and part of

Twenty ton rock cutter working at Cap-à-la-Roche, St. Lawrence river.



Automatic Acetylene gas and whistling buoy.

Northumberland strait, are established 241 light stations, showing 273 lights. Cape Race, Newfoundland, is included in this list.

There are 4 submarine warning stations, 2 lightships and 29 fog alarm stations. The gas and combined and automatic whistling and bell buoys are included in district No. 1 above referred to.

In the waters surrounding Prince Edward Island, in the strait of Northumberland and Gulf of St. Lawrence, the total number of light stations is 49, showing 75 lights, 3 fog alarm stations, 6 combined gas and whistling buoys, 1 gas buoy and numerous unlighted buoys.

The Quebec district includes the Gulf of St. Lawrence from the entrances of Belle Isle strait and Cabot strait up to Quebec city, also some of the rivers and bays and harbours in the province. There are 139 light stations, showing 181 lights, 5 lightships, 35 fog alarm stations, 5 combined gas and bell buoys, 26 gas buoys and numerous steel and wooden unlighted buoys.

The Montreal district includes the St. Lawrence river above Quebec as far as Coteau and the Ottawa river. In this district are 115 light stations, showing 192 lights. The St. Lawrence river between Quebec and Montreal contains the greatest number owing to the fact that large ocean steamship navigation to Montreal is so important at night as well as in daylight.

Above Montreal on the way to the Great Lakes, the upper St. Lawrence river contains numerous lights and buoys for inland navigation.

On the Great Lakes there are 225 light stations showing 311 lights, 32 fog alarm stations, 1 lightship on Lake Erie, 78 gas buoys, 1 combined gas and whistling buoy and 1 combined gas and bell. The districts for the gas buoy service is divided into Prescott, Lake Ontario, Lake Erie, Georgian Bay, Sault Ste. Marie and Port Arthur districts.

Manitoba.

Manitoba has 6 light stations, showing 11 lights.

British Columbia.

The British Columbia waters, Pacific coast, are all included in one district, with headquarters at Victoria; the new section, with headquarters at Prince Rupert, includes the northern waters of British Columbia. British Columbia has 60 light stations, showing 101 lights, 26 fog alarm stations, lightships, 2 combined gas and whistling, 2 combined gas and bell buoys and 18 gas buoys, besides numerous steel and wooden buoys. Acetylene gas beacons unwatched have been placed in waters around isolated localities. These are charged by the supply steamers with calcium carbide at intervals.

LIFE SAVING SERVICE.

New Brunswick	3
Nova Scotia	14
Prince Edward Island	4
British Columbia	5
Ontario (Great Lakes)	11

Hydrographic surveys, tidal surveys, wireless telegraphy and fishery protection service are under the Naval Service of Canada.

See map at end of the book showing lighthouses and large buoys on the Atlantic coast, Great Lakes and Pacific coast of Canada.

AREA AND RESOURSES OF CANADA.

(See Resourses map at the end of Book.)

Adverting to inland and maritime navigation it is reasonable to assume that the navigable waters of Canada will be utilized in the future to a much greater extent than they have been in the past. The undeveloped resources of the country are so great, that we can safely conjecture that commerce, trade and traffic will increase immensely. The internal intercourse between one point and another must naturally grow, and the conveyance of necessary supplies, for comfort and use in new settlements, following the stream of immigration, will compel the use of our waters and other channels of transportation. The success of industry will provide new products which will require marketing.

The map which precedes this division of subjects dealt with in this book, and on which, among other valuable information, is graphically indicated the area and extent of mineral, agricultural, fishery, forestry and other resources, will convey more to the mind than volumes of text.

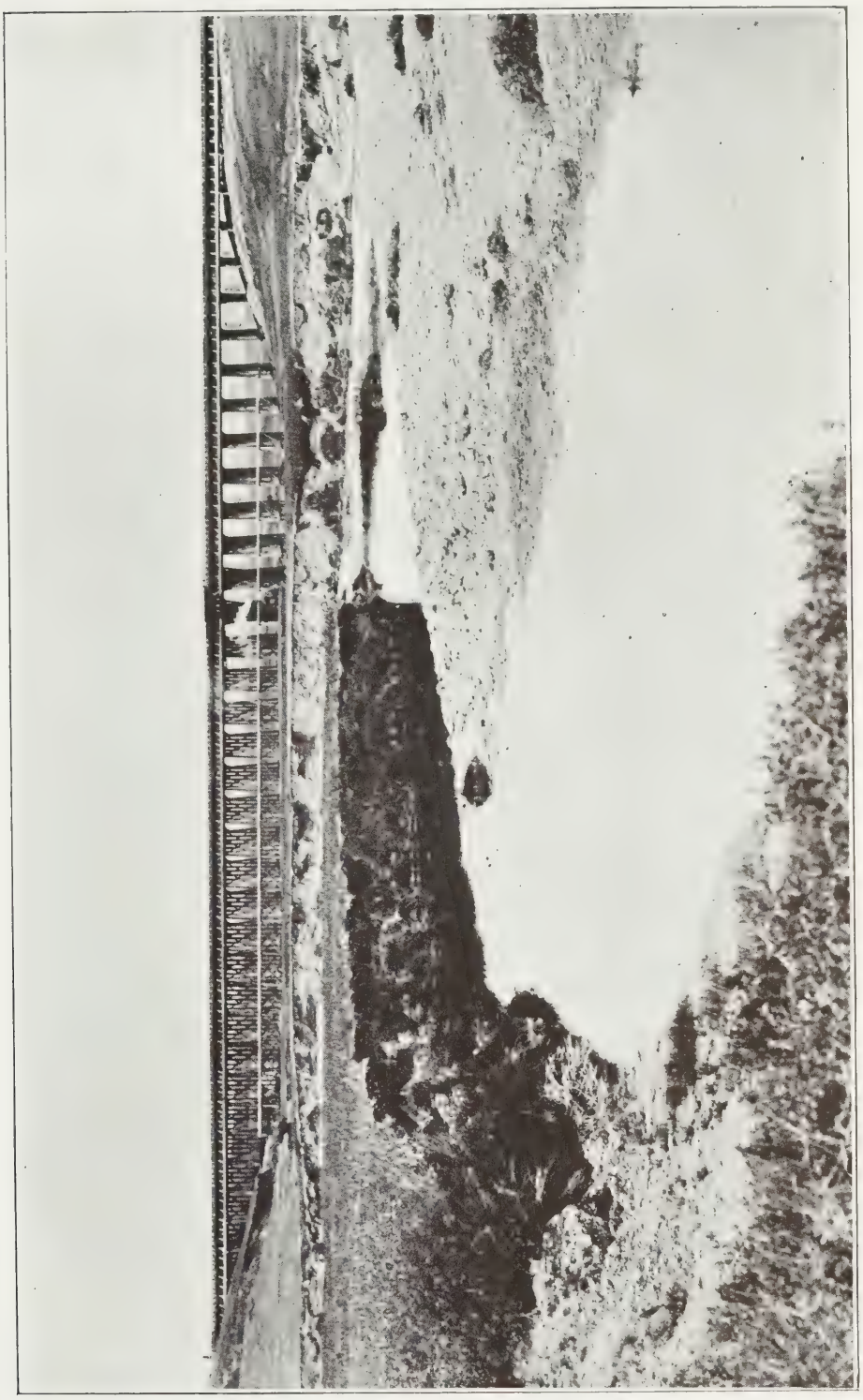
The forests of the country in unsettled sections are rich in game, and furs must continue to contribute to the wealth of the country.

The fertility of the soil of the northwest provinces is not excelled in any part of the continent. A scientific analysis of its constituents has proven beyond a doubt, that it is almost inexhaustible. Prof. Shaw, an authority on soil, has furnished the result of his scientific test of the soils of Manitoba, Saskatchewan and Alberta, an extract of which appeared in print in one of the pamphlets descriptive of the country, and is here quoted.

"The first foot of soil in the three provinces of Manitoba, Saskatchewan and Alberta, is its greatest natural heritage. It is worth more than all the mines in the mountains from Alaska to Mexico, and more than all the forests from the United States boundary to the Arctic sea, vast as these are. And next in value to this heritage is the three feet of soil which lies underneath the first. The subsoil is only secondary in value to the soil, for unless the former be of good value, there is a proportionate neutralization of the latter. The worth of a soil and subsoil cannot be measured in acres. The measure of its value is the amount of nitrogen, phosphoric acid and potash which it contains, in other words, its producing power. Viewed from this standpoint, these lands are a heritage of untold value. One acre of average soil in the Canadian West is worth more than twenty acres of average soil along the Atlantic seaboard. The man who tills the former can grow twenty successive crops without much diminution in the yields; whereas the person who tills the latter, in order to grow a single remunerative crop, must pay the vendor of fertilizers half as much for materials to fertilize an acre as would buy the acre in the Canadian West."

Canada is so well watered that where soil is found no arid sections exist. It is true, there are barren lands in the extreme north in the Coppermine river country, but climatic conditions are the the cause, even there, large herds of ruminating animals subsist on herbage and grasses, which spring up in the short summer months, and then migrate south and west, to browse upon the trees of the immense forests that extend along the southern parts of Mackenzie Territory. Ungava remains unexplored, but enough is known of its forests, fish, streams and minerals to remove all doubt about its wealth of natural resources. Franklin Territory is treeless but the musk ox and caribou are found in large numbers west of Hudson Bay and in the Arctic archipelego. Coal measures of great extent are plainly visible along the northern banks of Banks island, opposite Melville island.

The products of the country at the present time, furnish all the proofs necessary to lead to the conclusion that Canada contains all the elements necessary for great prosperity. The question of transportation of her commodities by water or rail, must for years to come, furnish problems for the people and the Government.



Alberta Railway and Irrigation Company project—Willow Creek Flume

The Intake, Southern Alberta Land Co., Ltd., Canal—Five steel gates each 8 feet high by 10 feet wide.

Area and Resources of Canada.

The total known area of Canada is 3,729,665,-000 square miles, exclusive of territory between Beaufort sea and Baffin bay, by map measurements, and 2,386,-985,395 acres, also map measurement; from this must be deducted 175,000 square miles of water area. By provinces the land and water area is as follows:—

Province.	Land Acres.	Water Acres.	Total Acres.	Total Sq. Miles.
Alberta.....	161,872,000	1,510,400	163,382,400	255,285
Brit. Col...	226,186,370	1,560,830	227,747,200	355,855
Manitoba....	41,169,098	6,019,200	47,188,298	73,732
New Brunswick..	17,863,266	47,232	17,910,498	27,985
Nova Scotia	13,483,671	230,100	13,713,771	21,428
Ontario.....	141,125,330	25,826,306	166,951,636	260,862
P. E. Island	1,397,991	.....	1,397,991	2,184
Quebec.....	218,723,687	6,474,874	225,198,561	351,873
Saskatchewan...	155,764,480	5,323,520	161,088,000	251,700
Yukon.....	132,113,360	415,280	132,528,640	207,076
N.W. Terr.	1,196,803,200	33,075,200	1,229,878,400	1,921,685
Total....	2,306,502,453	80,482,942	2,386,985,395	3,729,665

According to a table furnished by the Census department, and based on the census of 1911 and reports furnished by special officers in 1908, the area capable of cultivation in the Dominion, not including the Northwest Territories and Yukon, is 358,835,000 acres, or 36 per cent of the total area of the Dominion.

The area of field crops in Canada for the year ending March 31, 1911, was 32,853,074 acres, valued at local market rates at $565,711,600.

The area under wheat was 10,373,958 acres, and the total production was 215,851,000 bushels.

According to the above statement the area of cultivable land not yet cultivated is 325,981,926 acres, which shows the future possibilities of Canada.

FIELD CROPS, APPROXIMATELY.

According to the estimate made by the Census branch, the yield and value of the field crops of Canada in 1911 are as follows:—

Buffalo ranch, Pincher Creek, Alta.—Driving through 435 acres of fall wheat.

"The field crops of Canada are shown to have occupied last year a total area of 32,853,074 acres, and their value, calculated at the average local market prices, amounts to $565,711,600. The area under wheat for the year was 10,373,958 acres, of which 1,172,119 acres were fall wheat in Ontario and Alberta. The total production was 215,851,000 bushels of the value of $138,567,000. Fall wheat produced 26,014,000 bushels—value $21,461,000. Oats occupied 9,219,920 acres, and yielded 348,188,000 bushels of the value of $126,812,000, barley 1,404,352 acres, yielded 40,641,000 bushels of the value of $23,004,000 and flax 1,131,586 acres, yielded 12,921,000 bushels of the value of $19,467,000. The combined area under rye, peas, buckwheat, mixed grains and flax was 2,480,650 acres, the yield 44,986,000 bushels and the value $41,560,000. Hoed and cultivated crops comprising beans, corn for husking, potatoes, turnips and other

Harvesting—Dundurn, Sask.

Oats—Stony Plain district, Edmonton.

roots, except sugar beets, occupied 1,062,972 acres, and yielded 170,884,000 bushels of the value of $73,290,000. Sugar beet in Ontario and Alberta had an acreage of 20,878 and a yield of 177,000 tons of the value of $1,165,000. Fodder crops, including foddercorn, hay, clover and alfalfa, show an acreage of 8,290,344, a production of 15,499,000 tons and a value of $161,314,00. Alfalfa, a record of which was taken for the first time, shows an area of 101,781 acres, with a yield of 227,900 tons of the value of $2,249,000. This valuable fodder crop is being grown principally in Ontario, Quebec and Alberta, the average yield per acre for the whole of Canada being $2\frac{1}{4}$ tons."

"For the year 1911 the areas from which the yields are calculated are those of the recent Census, and the resulting data are not therefore strictly comparable with the estimates of the three previous years which were based upon the reports of selected correspondents. It may be mentioned, however, that the area and production of wheat in 1911 exceed by over 1,000,000 acres and 65,862,000 bushels the estimates of 1910. A more satisfactory criterion of the difference between the two seasons of 1911 and 1910 is afforded by the average rates of yield per acre, which for fall wheat was 22.19 bushels in 1911 against 23.49 in 1910, spring wheat 20.63 against 15.53, oats 37.76 against 32.79, barley 28.94 against 24.62 and flax 11.41 against 7.97.

In the three Northwest provinces of Manitoba, Saskatchewan and Alberta, the wheat production was 194,083,000 bushels, compared with 128,891,000 bushels the estimate of 1910, of oats 212,819,000, compared with 126,753,000, and of barley 24,043,000 compared with 21,377,000. The wheat production of 1911 in Manitoba was 60,275,000 bushels from 2,979,734 acres, in Saskatchewan 97,665,000 bushels from 4,704,660 acres and in Alberta 36,143,000 bushels from 1,616,899 acres.

By provinces the total value of all field crops in 1911 was as follows: Prince Edward Island $8,846,700, Nova Scotia $14,297,900, New Brunswick $16,797,000, Quebec $103,187,000, Ontario $193,260,000, Manitoba $73,136,000, Saskatchewan $107,147,000, Alberta $47,750,000 British Columbia $1,290,000.

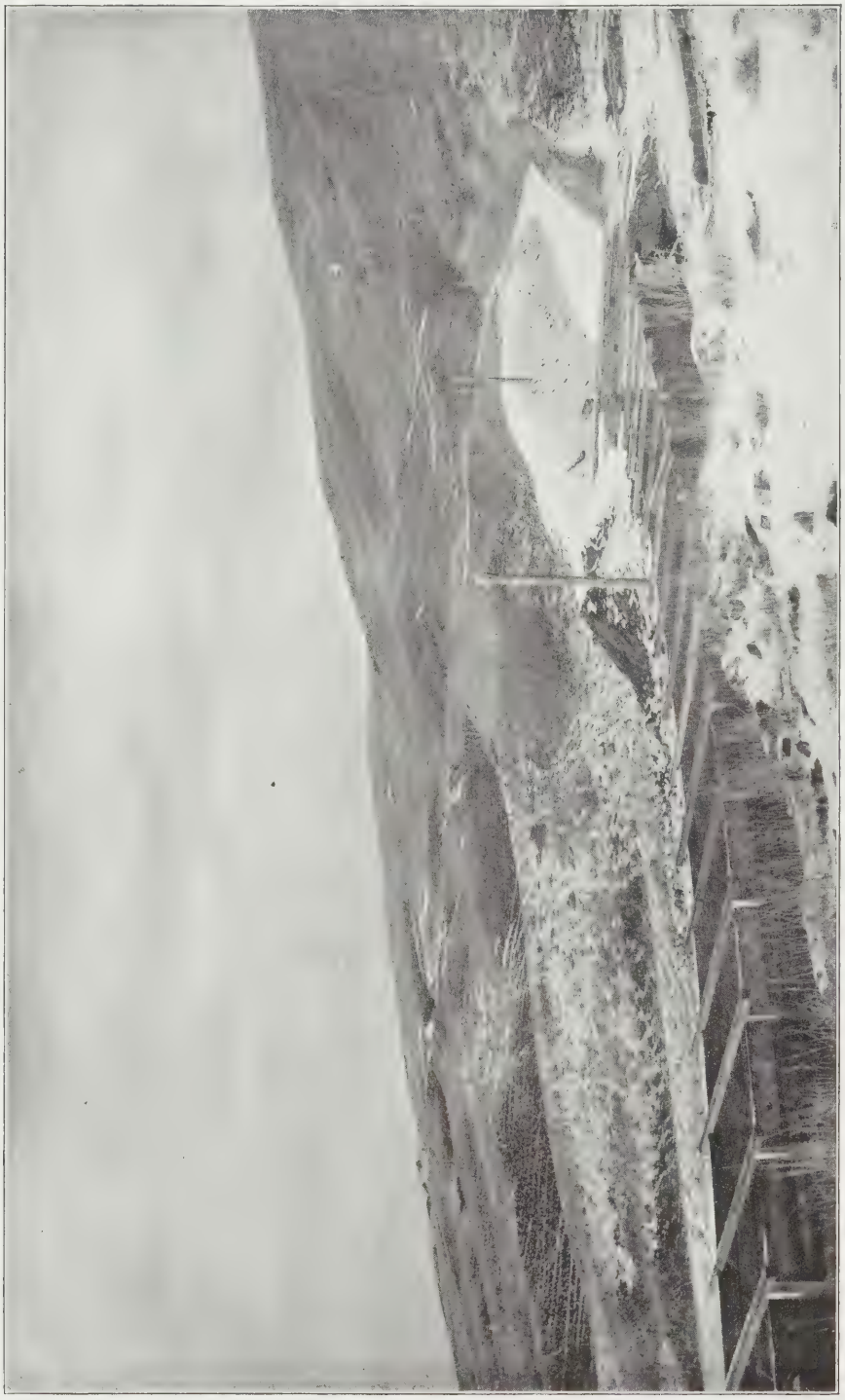
LIVE STOCK.

The following is an estimate of the number of live stock in Canada for 1911, but the values are not yet given in published form:—

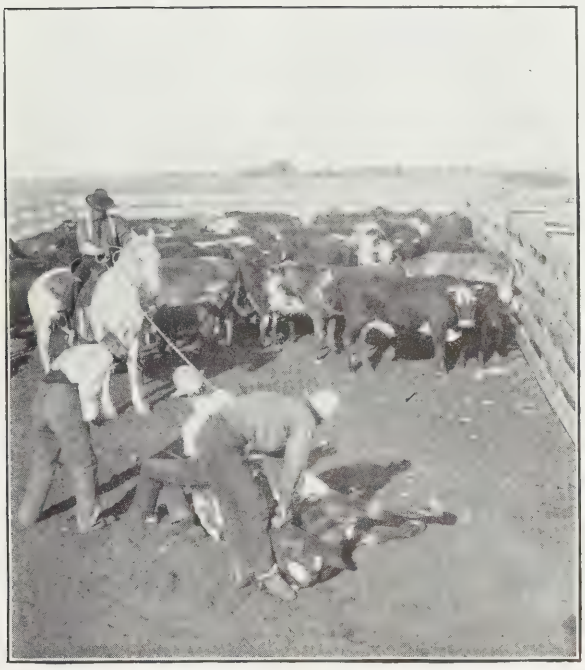
Canada—	
Horses	2,266,400
Milch cows	2,876,600
Other cattle	4,210,000
Sheep	2,389,300
Swine	2,792,200
Prince Edward Island—	
Horses	34,000
Milch cows	55,500
Other cattle	56,500
Sheep	108,600
Swine	46,400
Nova Scotia—	
Horses	69,000
Milch cows	151,700
Other cattle	180,900
Sheep	351,000
Swine	70,000

28 horses, harvesting, seeding and levelling—Pincher Creek, Alta.

White Valley Irrigation and Power Co. Ltd., Vernon, B.C.—36-inch continuous wood-stave pipe, B. X. Creek.



White Valley Irrigation and Power Co., Ltd. Vernon, B.C.—View of canal fifteen miles below Headgates.



Branding cattle—MacLeod, Alta.

New Brunswick—	
Horses	66,700
Milch cows	123,300
Other cattle	110,500
Sheep	190,800
Swine	93,000
Quebec—	
Horses	371,400
Milch cows	872,800
Other cattle	609,200
Sheep	533,400
Swine	697,500
Ontario—	
Horses	791,000
Milch cows	1,234,500
Other cattle	1,558,600
Sheep	975,400
Swine	1,469,800
Manitoba—	
Horses	251,800
Milch cows	161,200
Other cattle	293,300
Sheep	29,600
Swine	135,800
Saskatchewan—	
Horses	365,500
Milch cows	143,600
Other cattle	444,700
Sheep	111,300
Swine	130,300

COMPARATIVE Statistics of the fruit growing industry in Canada for the year 1911. Provinces of Manitoba, Saskatoon and Alberta not included. From Census Returns.

Orchard and nursery	Acres	376,322
Vineyard	"	10,411
Small fruits		17,613
Apple trees	No.	14,836,492
Bearing	"	9,453,775
Non-bearing	"	5,376,717
Product	Bush.	10,384,985
Peach trees	No.	1,884,459
Bearing	"	849,634
Non-bearing	"	1,034,825
Product	Bush.	543,485
Pear trees	No.	951,896
Bearing	"	584,963
Non-bearing	"	366,933
Product	Bush.	494,474
Plum trees	No.	1,692,871
Bearing	"	1,066,903
Non-bearing	"	625,968
Product	Bush.	475,949
Cherry trees	No.	1,211,911
Bearing	"	722,886
Non-bearing	"	489,025
Product	Bush.	224,785
Other fruit trees	No.	240,927
Bearing	"	116,196
Non-bearing	"	124,731
Product	Bush.	56,358
Total fruit trees	No.	20,812,556
Bearing	"	12,794,357
Non-bearing	"	8,018,199
Grapes	lbs.	36,999,296
Strawberries	qts.	13,909,163
Currants and gooseberries	"	3,109,372
Other small fruits	"	7,449,776

CENSUS OF DAIRY INDUSTRIES OF CANADA, 1911.

Ottawa, March, 1912.—The Census and Statistics Bulletin for March, issued to-day, gives the records of butter, cheese and condensed milk as collected at the census of last year. There were 3,628 factories in operation in 1910. The quantity of butter made in the year was 59,875,097 pounds, having a value of$15,682,564. This is 23,818,358 pounds more than in 1900, and the value is more by $8,441,592. The quantity of cheese is 231,012,798 pounds, which is more than at the previous census by 10,179,529 pounds, but the value is less by $600,776. The total value of butter, cheese and condensed milk in 1910 was $39,143,089, and in 1900 it was $29,731,922, being an increase of $9,411,167 in ten years.

Taking butter alone, the value of the factory product was $7,240,972 in 1900, and $15,682,564

in 1910, and the value of cheese alone was $21,890,432 in 1900 and $21,620,654 in 1910. The average price of factory butter was 20 cents per pound, and of cheese 10 cents per pound, whilst in 1910 the average price of butter was 26.2 cents per pound and of cheese only 9 cents per pound.

A comparison of the quantities and values of the production of butter and cheese is given in the following tables by provinces for the census years 1901 and 1911 for the preceding years respectively.

CENSUS OF FACTORY BUTTER.

Provinces.	1900.		1910.	
	lbs.	$	lbs.	$
Alberta.....	406,120	82,630	2,149,121	533,422
Brit. Col...	395,808	105,690	1,206,202	420,683
Manitoba. .	1,557,010	292,247	2,050,487	511,972
N. Brunswick.....	287,814	58,589	849,633	212,205
Nova Scotia	324,211	68,686	354,785	88,481
Ontario.....	7,559,542	1,527,935	13,699,153	3,482,171
P. E. Island	562,220	118,402	670,913	156,478
Quebec.....	24,625,000	4,916,756	37,346,107	9,895,343
Saskatchewan.....	339,014	70,037	1,548,696	381,809
Totals....	36,056,739	7,240,972	59,875,097	15,682,564

CENSUS OF FACTORY CHEESE.

Provinces.	1900.		1910.	
	lbs.	$	lbs.	$
Alberta.....	27,693	3,970	193,479	23,473
Brit. Col...	.....	.....	.....	.....
Mantoba. .	1,289,413	124,025	694,713	81,403
New Brunswick.....	1,892,686	187,106	1,166,243	129,677
Nova Scotia	568,147	58,321	264,243	29,977
Ontario.....	131,967,612	13,440,987	157,631,823	14,845,661
P.E. Island.	4,457,519	449,400	3,293,765	354,378
Quebec.....	80,630,199	7,957,621	67,741,802	6,152,689
Saskatchewan.....	.....	.....	26,730	3,396
Totals....	220,833,269	22,221,430	231,012,798	21,620,654

The increased price of factory butter led to a larger production in 1910 than in 1900, and this was made especially in Quebec at the cost of a lower production of cheese. The change was further induced by the lower rate of duty on cream in the United States, which encouraged larger exports to that country.

The number of condensed milk factories in operation increased from four in 1900 to twelve in 1910, and the value of product increased from $269,520 to $1,839,871. There are now six factories in Ontario with a product value of $1,335,689, two in Nova Scotia with $133,956, two in Quebec with $275,000, one in British Columbia with $44,326, and one in Prince Edward Island with $50,900. In 1900 there were two factories in Nova Scotia and one each in Prince Edward Island and Ontario.

ARCHIBALD BLUE,
Chief Officer.

Census and Statistics Office,
April, 1912.

STATEMENT OF AREAS CORRECTED TO JANUARY 1, 1912.

(From Surveyor General).

		Acres.
Area in surveyed sections (all water covered lands deducted)	Man.....	25,892,630
	Sask.....	67,731,270
	Alta.....	56,163,947
Total.....		149,787,847
Water covered lands in surveyed sections	Man.....	3,283,357
	Sask.....	1,689,396
	Alta.....	1,722,690
Total.....		6,695,443
Area of road allowance	Man.....	908,882
	Sask.....	1,407,020
	Alta.....	1,073,054
Total.....		3,388,956
Area of parish and river lots	Man.....	486,311
	Sask.....	81,974
	Alta.....	96,603
Total.....		664,888

THE MINERAL PRODUCTION OF CANADA.

The mineral production of Canada as reported by the Mines Branch of the Department of Mines was for the calendar year 1911, $102,291,686. Of this sum the metallic products amounted to: copper $6,911,831, gold,

$9,762,096, pig iron 12,306,860, lead $818,672, nickel $10,229,623, silver $17,452,128, and other metallic products $409,674, a total metallic production valued at $57,890,884, without making allowance for iron ore imported. The non-metallic products were: asbestos and asbestic, $2,943,107, coal $26,378,477; gypsum, $978,863, natural gas $1,820,923, petroleum $357,073, salt $443,004, cement $7,571,299, clay products $8,317,709, lime $1,493,119, stone $3,680,371, miscellaneous non-metallic $2,110,313, a total non-metallic production valued at $56,094,258. Of the total value as above, Nova Scotia produced 15.01 per cent, New Brunswick 0.60 per cent, Quebec 8.88 per cent, Ontario 41.72 per cent, Manitoba 1.65 per cent, Saskatchewan 0.60 per cent, Alberta 6.26 per cent, British Columbia 20.76 per cent, Northwest territories 4.52 per cent.

Gold. Gold has been discovered in the Klondike, McMillan river, Klane, Big Salmon river in Yukon territory, Atlin, Queen Charlotte and Vancouver islands, Quesnel river and Fraser river, Thompson river and other localities in British Columbia, near Edmonton in Alberta, Lake of the Woods district in Manitoba; above Port Arthur, Gowganda and Porcupine in Ontario, Beauce in Quebec and south and east coasts of Nova Scotia.

The total value of gold produced in Canada in 1911 was $9,762,096. Of this amount, the Yukon mines yielded $4,580,000, British Columbia, $4,989,524, Nova Scotia $142,000, Quebec, $12,443, and Ontario $37,929.

Silver. The total production for the calendar year 1911 was 32,740,748 ounces, of which 30,761,690 ounces were the product of Ontario, 1,910,323 ounces of British Columbia, 50,300 ounces from the Yukon, and 18,435 from Quebec. Canada exported 31,216,725 ounces of silver in 1911, valued at $15,807,366.

Copper. Though British Columbia is the chief source of the copper production, having produced 35,480,212 pounds in 1911, Ontario, Quebec, Nova Scotia, are important sources of supply. Ontario, in 1911, shipped 21,402,221 pounds, and Quebec 3,123,189 pounds. The total exports of copper in 1911 was 55,287,710 pounds, valued at $5,467,725.

Lead. Though lead has been discovered on the north shore of Thunder Bay, Ontario, on the south shore of Great Slave Lake, west shore of Richmond Gulf on the east of Hudson Bay; west shore of Lake Mistassinis: Calumet island, P.Q., in Inverness county, Cape Breton, and other mining districts, almost all the lead produced is the product of British Columbia mines. The total production of lead in Canada in 1911 was 23,525,050 pounds, valued at $818,672.

In order to encourage the lead mining industry in Canada, an Act was passsed by the Federal Parliament in 1903, granting a bounty of 75 cents per one hundred pounds for lead produced from ore mines and smelted in Canada when the market fell below £12 10s. per ton, and ceasing' when it rose to £16 per ton in Britain. The amount of bounty paid on lead in 1911 was $219,557.70.

Zinc. Zinc is found chiefly at Whitewater, Kaslo, Silveron, Sandon in British Columbia, Olden in Frontenac county and Nipigon district, Ontario. The total quantity of zinc ore produced in Canada in 1910 was 5,063 tons, valued at $120,003.

Antimony. Antimony is produced chiefly in the Lake George district, New Brunswick, and the lead mines of British Columbia. The value of the antimony produced in 1910 was $13,906.

Cobalt. Cobalt is found in the district of Ontario bearing that name. The estimated value of the product of 1910 was $94,965.

Molybdenum. This metal is found in various parts of Ontario, Quebec, New Brunswick and Nova Scotia and British Columbia. It is not extensively mined, and is used chiefly in hardening steel.

Nickel. The nickel supply of Canada is derived from the nickel-copper deposits of Sudbury, Ontario, and the silver mines of Cobalt, Ontario. The total production of matte in 1911 was 32,607 tons, valued at the smelters at $4,945,593, and the metallic contents were 17,932,263 pounds copper and 34,098,744 pounds of nickel.

Iron. The chief sources of iron production in Canada are the province, of Ontario, Quebec and Nova Scotia. The Michipicoten, Moose Mountain, in Hutton township, the Dominion Bessemer Ore mines twenty-three miles east of Port Arthur, and other mines in the Thunder Bay district, the Wilber in Lanark county in the province of Ontario; Pontiac, Wright and Quebec counties in the province of Quebec; Londonderry, Torbrook, Springhill, Pictou, Whycocomah in Nova Scotia, and near Bathurst in the province of New Brunswick.

The total tonnage of pig iron produced in Canada in 1911 was: Ontario 526,635 tons valued at $7,606,674; Nova Scotia 390,242 tons valued at $4,682,904, and Quebec 658 tons valued at $17,282, amounting in all to 917,535 tons, valued at $12,306,860. Iron has also been discovered in considerable quantities in Vancouver island and several other portions of British Columbia; on the west shore of Great Slave and Great Bear lakes; on the Hayes river; on the east shores of Hudson and James and Ungava bays and in many other portions of the Northwest.

Coal. Coal is mined chiefly in Nova Scotia, British Columbia, Alberta, Saskatchewan, New Brunswick and Yukon Territory. The total production of coal in the above provinces for the year 1911 was 11,291,553 tons, valued at $26,378,477. Of this Nova Scotia yielded 6,994,120 tons, valued at $14,050,687; British Columbia, 2,536,502 tons, valued at $7,926,569; Alberta, 1,498,057 tons, valued at $3,933,958; Saskatchewan 204,253 tons, valued at $342,921; New Brunswick, 55,781 tons, valued at $111,562; Yukon, 2,840 tons, valued at $12,780.

The export of coal from Canada for the year 1911 was 1,500,639 tons, valued at $4,357,074.

The import of coal in 1911 amounted to 14,558,892 tons, valued at $39,292,591. It can thus be seen that of the 24,349,806 tons of coal consumed in Canada during 1911, only 46.372 per cent was the product of Canada mines, but a large quantity of imported coal was anthracite.

Coke. According to the Department of Mines, 1911 Report, the total amount of coke produced in Canada during that calendar year was 847,402 tons, valued at $2,340,674, and the quantity imported during the same period was 751,389 tons, valued at $1,843,248. According to these figures only about 53 per cent of the 1,598,795 tons of coke consumed in Canada in 1911 was the product of home ovens.

Graphite. Graphite is found near Buckingham, Quebec, Whitefish, Lake Ontario, and artificial graphite is produced at Niagara, Ont. There is a growing demand in Great Britain for graphite. The production in Canada, during 1910, was 1,392 tons, valued at $74,087.

Gypsum. Gypsum is chiefly found in Nova Scotia, New Brunswick and in smaller quantities in Ontario and Manitoba. It is largely used in the manufacture of cement. The amount produced in 1910 was 525,246 tons, valued at $934,446.

Mica. Mica is found chiefly in Ottawa county in the townships of Buckingham, Templeton, Hull and Wakefield, in the province of Quebec; in North Burgess and South Sherbrook, in Lanark Leeds and Frontenac counties in Ontario.. The mica produced in1910 was valued at $190,385.

Chromite. Chromite is found chiefly in the asbestos district of Black lake, P.Q., but is found in several parts of Quebec and Gaspe counties, P.Q. 299 tons valued at $3,734 was mined in 1910.

Manganese. Manganese is found in Nova Scotia, but the chief source of supply is from the carboniferous limestones of Sussex, N.B.

Antimony. This mineral is found in West Cove, Hants county, N.S., from whence a considerable quantity has been shipped, Prince William, west of Fredericton, and South Hain, P.Q. It is generally found in gold bearing districts.

Petroleum. The total quantity of petroleum produced in Canada in 1911 was 291,092 barrels, or 10,188,219 gallons, the value of which was $357,073. The value of natural gas produced in Canada in 1911 was $1,820,923, of which $96,665 was the production of Alberta and $1,724,258 of Ontario.

A shipment of seedlings as baled and packed ready to be sent out to settlers, from the Nursery Station, Indian Head, Sask.

Two-year old ash-seedlings being grown for distribution at Forest Nursery Station, Sask.

View at Forest Nursery Station in Fall of 1904, before any planting was done.

View of Forest Nursery Station, Indian, Sask.

FISHERIES.

The total value of the Canadian fisheries for the year ending March 31, 1911, was $29,965,433.

Of this amount the sea fisheries product was $26,122,596, the inland $3,842,837.

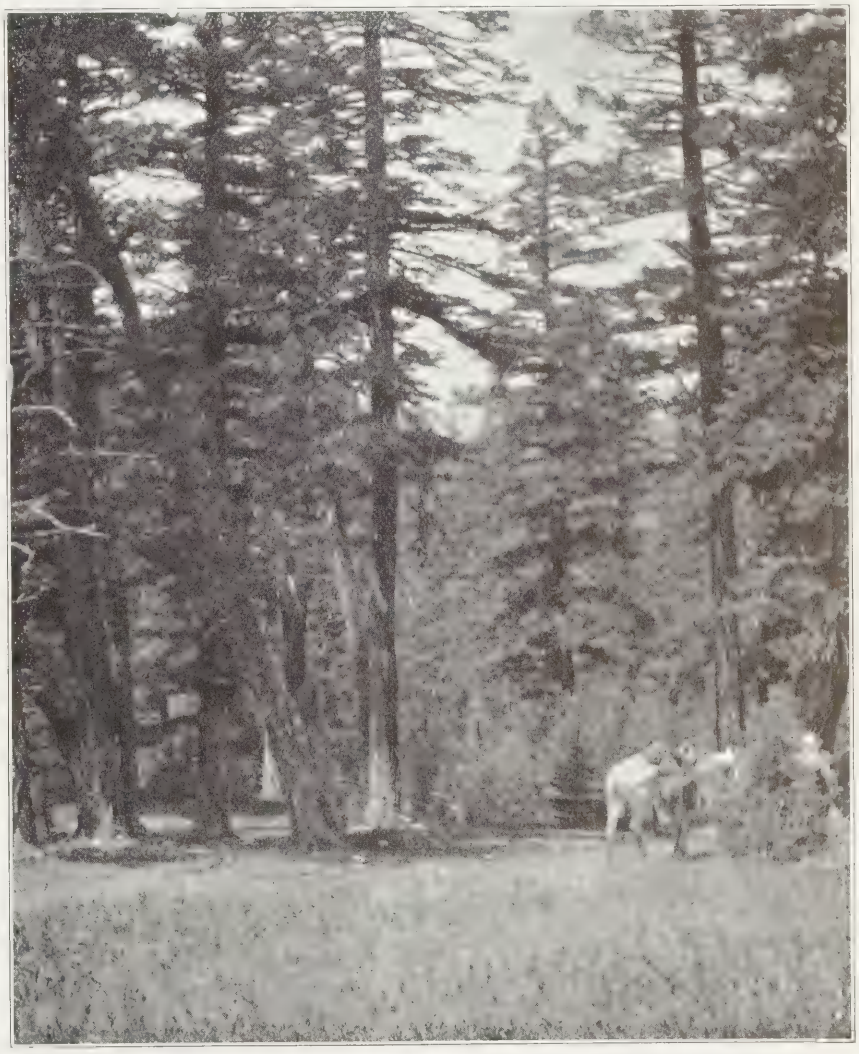
The value of the fisheries by provinces for 1911 was as follows:—Nova Scotia, $10,119,243; British Columbia, $9,163,235; New Brunswick, $4,134,144; Ontario, $2,026,121; Quebec, $1,692,475; Manitoba, $1,302,779; Prince Edward Island, $1,153,708; Saskatchewan,$172,903 Yukon, $118,365; Alberta, $82,460.

68,610 men were employed in fishing and 24,978 in the various ways of preparing the fish for market. 1,680 vessels and tugs, and 38,977 boats were used in fishing during the year 1911. According to the Fisheries Report for 1910-11, the values of the principal commercial fish are as follows:

Salmon	$7,205,871
Cod	5,921,248
Lobsters	3,784,099
Herring	2,278,842
Halibut	1,251,839
Haddock	1,218,759
Whitefish	983,594
Trout	825,290
Smelts	797,066
Sardines	539,227
Pickerel	508,513
Hake and cusks	508,354
Mackerel	400,182
Pike	330,729
Clams and quhaugs	383,529
Oysters	198,689
Alewives	137,278
Eels	110,802

FORESTRY.

From the reports of the Forestry Branch of the Department of the Interior, information respecting the forest area of Canada has been obtained. A conservative estimate of the forest covered lands gives an area of 451,000,000 acres. Many forest reserves are located in Ontario, British Columbia and Alberta. Forests of coniferous trees extend from Ungava on the east to the Yukon territory on the west, and throughout all the provinces south. Deciduous trees of varieties of hardwood are found in the Maritime provinces, Quebec, Ontario and British Columbia, but principally in Ontario, showing the great varieties of the foliage of the province; affording also fine-grained woods for handsome furniture, decorations and internal finish of houses and ships' cabins. Square timber of birch, beech, maple and oak has long been an article of export and other varieties of hardwood are extensively used for home consumption.



Commission of Conservation.—Douglas fir in Bow River Valley—Diameter breast high 30 to 36 inches.

The Douglas fir of British Columbia is of large dimensions and great strength, having a tensile strength nearly, if not equal, to oak. The pine forests of Ontario, Quebec and New Brunswick yield an article of lumber in demand the world over, and spruce of an exceptionally good quality and strength grows in Nova Scotia.

Forest Products.

The lumber, square timber, lath and shingles produced in Canada during the year 1910, had a total value of $83,989,197. The products as reported for 1910, were as follows:—4,901,649,000 feet of lumber, worth $77,503,187; 37,962 tons of square timber (exported), worth $985,255; 1,976,640,000 shingles, worth $3,557,211, and 851,953,000 lath, worth $1,943,544.

Of this total, Ontario produced 1,642,191 m. feet, valued at $30,011,009; British Columbia, 1,619,904 m. feet, valued at $24,823,441; Quebec, 790,197 m. feet, valued at $11,340,323; New Brunswick, 419,233 m. feet, valued at $5,560,780 Nova Scotia, 260,871 m. feet, valued at $3,344,075; Saskatchewan, 75,931 m. feet, valued at $1,092,571; Alberta, 45,127 m. feet, valued at $644, 717; Manitoba, 42,922 m. feet, valued at $615,215, and Prince Edward Island, 5,273 m. feet, valued at $71,056, all board measurement.

WATER POWER.

Summary of water power developed and undeveloped in Canada as given by the Conservation Commission.

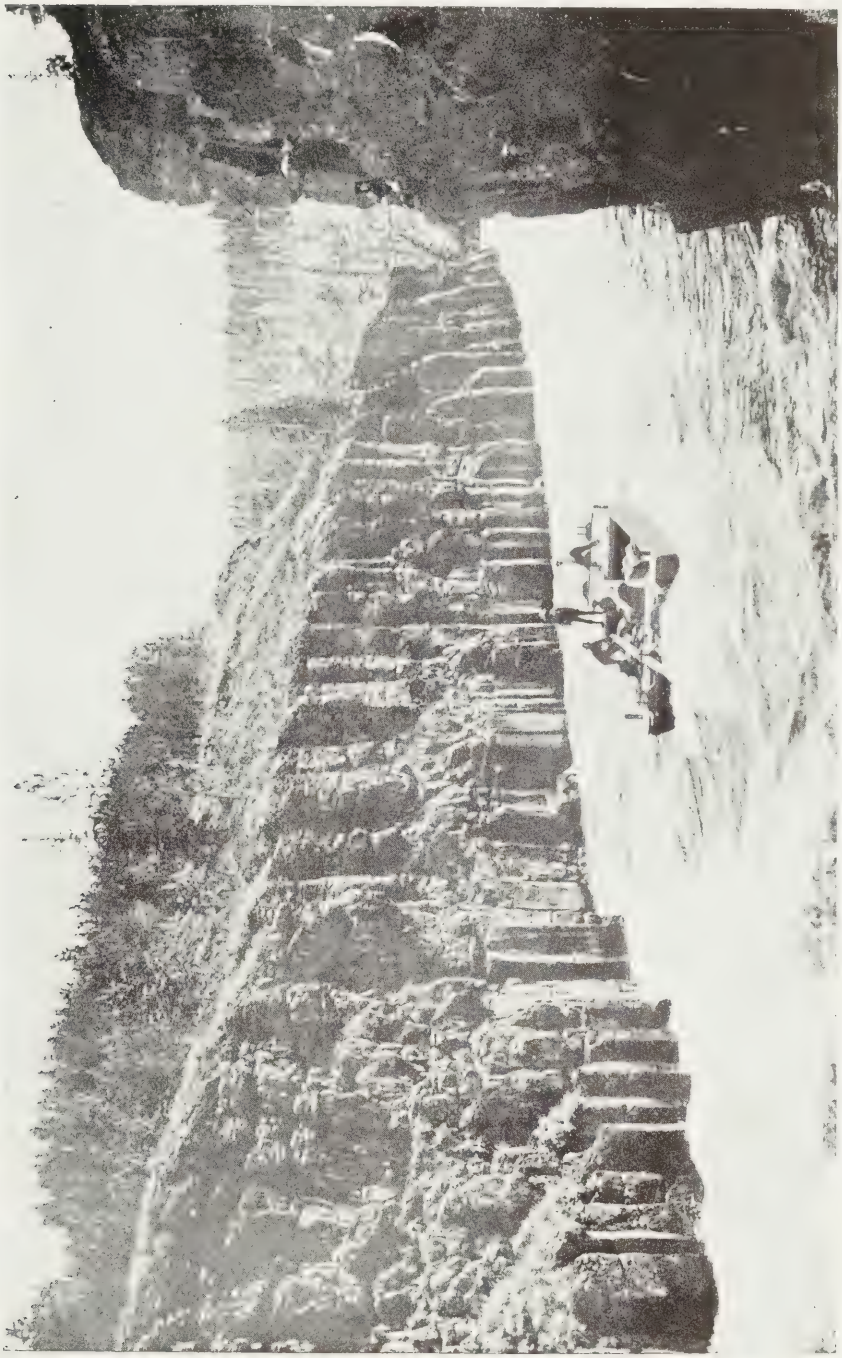
	Developed power. Horse power.
Ontario	532,266
Quebec	300,153
Nova Scotia	15,272
New Brunswick	9,765
Prince Edward Island	500
Manitoba	48,300
Saskatchewan	45
Alberta	7,300
British Columbia	100,920
Yukon	2,000
Or a total of	1,016,521

The information respecting the actual amount of water power in Canada is by no means complete, as a great portion has not been investigated, but from information to hand the amount of available power comes to over 20,000,000 horse-power. The area from which the above data has been obtained is less than 50 per cent of the Dominion.

TAR SAND, ATHABASKA.

Extract from report by Mr. Frank J. P. Crean, C.E., who explored part of Saskatchewan and Alberta, north of the surveyed areas:—

Commission of Conservation.—Magaguavic River, N.B.—Water-driven pulpmill, containing also an electric generating system.



Commission of Conservation.—White Horse Rapids—Lewes River, Yukon.

Commission of Conservation.—Ouiatchan Falls, Lake St. John, P.Q.

"The out-crop of tar-sand commences about 30 miles south of McMurray on the Athabaska river. It continues to about 40 miles below McMurray on the Athabaska river. It extends to the east and west for at least 30 miles, and varies in thickness from 20 to 225 feet, with probably an average of 150 feet thickness, according to the Geological Survey Report of 1893. The enormous quantity of this mineral has been variously estimated, and in the report of the Geological Survey of last season a great deal of useful information is recorded concerning it. Copies of this report may be had on application to Dr. Brock, Director of the Geological Survey, Ottawa.

"Tar-sand is spoken of by many different names. Some object to the name 'tar-sand,' holding that it does not contain tar. This objection cannot possibly be sustained, as it does contain a very high percentage of mineral tar, or pure bitumen.

" 'Asphalt,' or 'Asphaltum,' is another name frequently applied to it. This is hardly correct, although it does contain a percentage of asphalt or bitumen.

"According to an analysis made by Dr. Hoffman, late chemist to the Geological Survey of Canada, of a specimen of this substance collected by Dr. Bell, also late of the Geological Survey, it was found to contain:—

Bitumen	12.42 per cent.
Water (mechanically mixed)	5.85 "
Siliceous sands	81.73 "

TONNAGE OF VESSELS ENTERED AND DEPARTED.

The total registered tonnage of British, Canadian and Foreign vessels entered inwards from sea during the year ending 31st March, 1911, was 11,919,339 tons and the registered tonnage of British, Canadian and Foreign vessels outward for sea was 10,377,847 tons.

The total tonnage of Canadian and United States vessels trading on the inland waters, which arrived at Canadian ports was 13,286,102 tons and the tonnage of those which departed from Canadian ports was 11,846,257.

The total tonnage of British and Foreign vessels employed in the coasting trade of Canada which arrived in Canadian ports, was 34,280,669 tons and the tonnage of those departed was 32,347,265 tons.

	Entered. Tons.	Departed. Tons.
Seagoing	11,919,339	10,377,847
Inland	13,286,102	11,846,257
Coasting	34,280,669	32,347,265
Total	59,486,110	54,571,369

The value of Canadian exports for the year ending 31st. March, 1911, was $297,196,365 of which $274,316,553 were the product of Canada and $22,879,812 were the product of foreign countries.

The imports for the same period amounted to $472,247,540 of which $180,428,739 were sdmitted free.

The total registered tonnage of seagoing vessels entered at Montreal:

	Tons register
Inward	3,144,215
Outward	2,281,044
Total	5,425,259

The total value of merchandise in transit from foreign countries and transhipped by the St. Lawrence route during the fiscal year 1911 was $18,510,807.

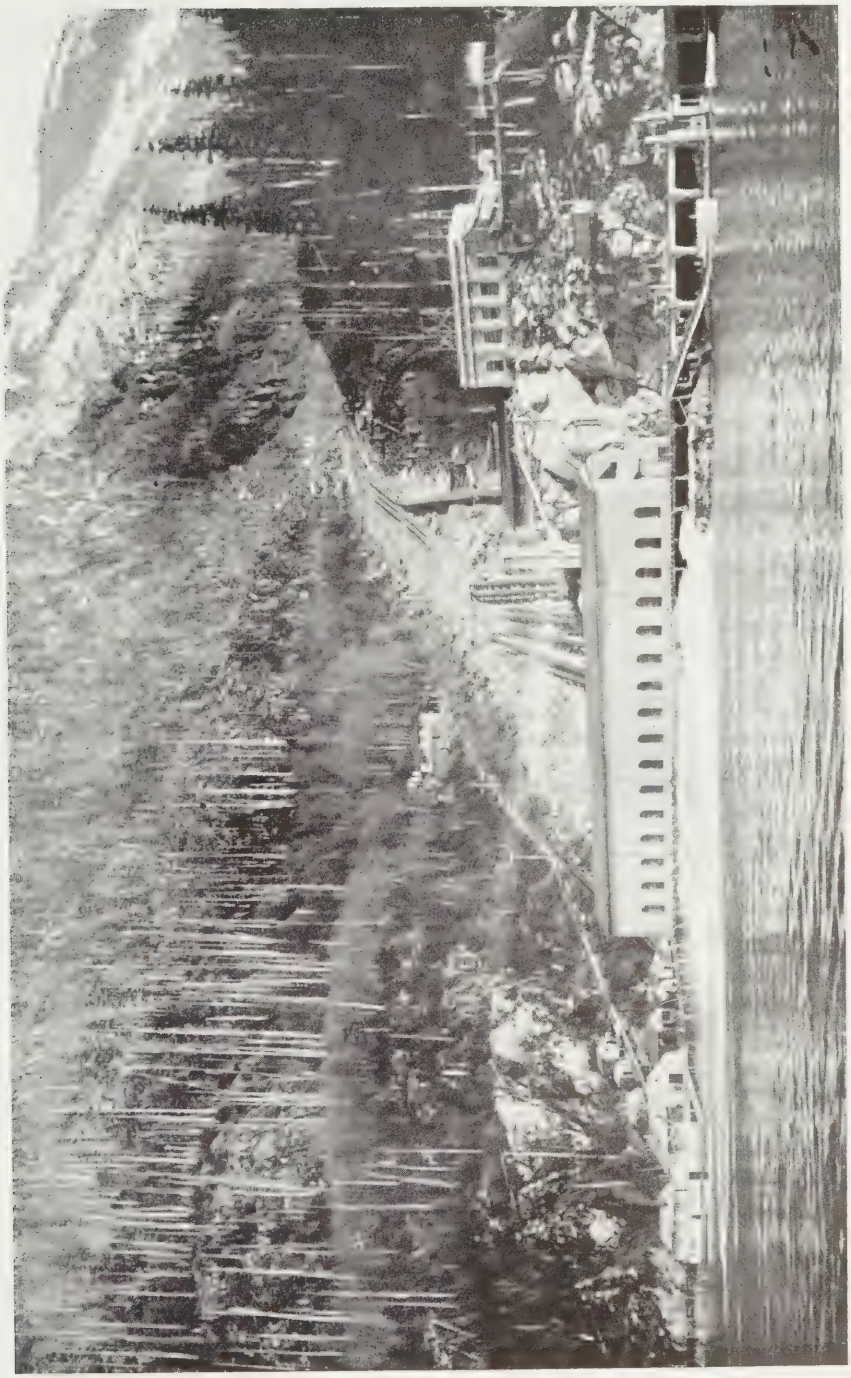
The revenue of the Dominion of Canada for the fiscal year 1912 is not yet reported, but calculated by the Minister of Finance will be $136,000,000, and the expenditure for the same period, chargeable to consolidated fund, $97,000,000, leaving a surplus of $39,000,000.

The total British capital invested in Canada up to January, 1911, was $1,815,267,000.

The total immigration into the Dominion of Canada from 1897 to 1911 both inclusive was 1,886,529, of which 723,424 were British and 650,719 American.

The total number for 1910–11 was 311,084 of which 123,013 were British and 121,451 American. The total homestead entries for 1911 was 44,479. The total value of settlers' effects for the same year was $14,072,611.

Commission of Conservation.—Stave Falls, B.C.—Western Canada Power Co., of Vancouver.



Commission of Conservation.—Vancouver Power Company—Power House, Worth Arm, Burrard Inlet, B.C.

Commission of Conservation.—Vancouver Power Company—Opening of tunnel connecting Coquitlam's and Bucatzen Lakes.

Commission of Conservation.—Laurentide Paper Co.'s plant, Grand Mere, P.Q.

Commission of Conservation.—Metis Falls, Metis River, Matane, P.Q.

RAILWAYS OF CANADA.

THE GRAND TRUNK RAILWAY SYSTEM.

The Grand Trunk Railway System was incorporated in the year 1852 and therefore in the early history of railroads not only in Canada, but on the American continent holds a prominent place. By purchase, amalgamation and leases, it now has a network of tracks of 7,381 miles.

It is principally located in the most thickly settled parts of Canada, with branch lines, and feeders into the well populated parts, industrial centres and summering resorts. The system as now composed begins at the eastern terminus of the main lines at the city of Quebec.

Quebec.

This famous city occupies one of the foremost places historically among the cities on this continent. It has been the seat of wars in many centuries, tribes of red men fought their battles on its heights, the white man here struggled with the red man for possession; two European nations arrayed their armies around its cliffs and alternately held this stronghold, the key to the mighty St. Lawrence; one European nation strove for its possession against a nation of this continent. Historians have made it the special subject of their chapters, poets and romancers have found material unequalled for their productions, painters have found scenery here for the manifestation of "human arts." Its surroundings are as well known by name as any city on our globe and deservedly, because of their picturesque locations and panoramic effects. The scored and serrated cliffs and rounded promontories washed at the foot by the St. Charles river and mighty St. Lawrence, the Montmorency Falls, 60 feet higher than Niagara Falls, are distinctly in view and the forestclad hills on the opposite side of the St. Lawrence all combine to make up a remarkable scene of grandeur.

As a sea-port Quebec has a prominent place among the ports of the world and it holds the distinguished position of having been the point of departure of the first steam propelled vessel that crossed the Atlantic Ocean.

At present it contains types of mediæval and modern architecture consisting of quaint dwellings, substantial new buildings of native rock and brick, narrow streets, broad thoroughfares, ancient types of vehicles and modern chaises and the latest pattern of automobiles. Level driveways pass around the foot of the cliffs in the lower town and ascending streets lead to the upper and modern part of the city and continue to the citadel which crowns its heights.

The promenade along the heights, cut in the rock, is spacious and of considerable length. It affords a splendid view of the surroundings and of steamers as they pass up and down the St. Lawrence river to Montreal or take their berths at the docks of Quebec to land ocean passengers and thousands of immigrants. From the promenade can be seen at various times the naval vessels of different nations lying at anchor in the stream. Adjoining this promenade is the famous Chateau Frontenac, a splendid hotal of unique architectural design, overlooking the river and having a situation unequalled perhaps anywhere. Other commodious hotels cater for the patronage of numerous excursionists, visitors, commercial men and world travellers. Quebec attracts visitors not only in summer but in winter. The brilliant social functions bring to the city fashionable and wealthy people from the other parts of the Dominion and United States. Here too are seen some of the most picturesquee exhibitions of Canadian out door sports.

Levis.

The Grand Trunk station at Levis is connected by a ferry which conveys its numerous passengers summer and winter to Quebec. At Levis the Grand Trunk has through connections with the Intercolonial Railway running through the far famed Metapedia Valley to the Maritime Provinces.

Richmond Junction.

The line runs along the south shore of the St. Lawrence to Richmond Junction in the province of Quebec, distance 97 miles from Quebec from Richmond Junction, to Montreal 67, total from Quebec to Montreal 164 miles. Another terminus is Portland, Maine, U.S., on the Atlantic coast where the railway has large yards, car sheds and machine shops. Portland, for

Portland, Maine.

America, is a venerable city; like Quebec it has an extremely interesting history of wars with the red men and their French allies. The home of her favourite and most illustrious son, Longfellow, is yet maintained as a memorial of his fame. This city is prosperous and presents many features of enterprise in its recovery from three extensive conflagrations, has many beautiful well shaded streets, fine public buildings and private residences with spacious grounds. Its early prosperity was due to ship-building, the lumber trade and trade with the West Indian Islands.

Portland has a magnificent harbour and ocean liners find ample depth of water and wharf accommodation at her "black wharves and quays." The Grand Trunk here makes connection with these ocean liners which convey many passengers to and from the United States and Canada. It has through connections running to different towns and cities in Maine and connects with the Boston and Maine Railway, going south, at the Union Station. The line runs from Portland to Montreal via Richmond Junction, the distance being 297½ miles. The Grand Trunk main line runs to Rouses Point, N.Y., on lake Champlain. From Rouses Point the line traverses the country to St. Lambert and crosses the St. Lawrence river over the world famed Victoria Jubilee bridge to Montreal.

Montreal.

Montreal is the commercial metropolis of Canada and the entrepot of merchandise from foreign countries. Here fruits from ports in tropical climates and European groves are landed, sold and distributed to eastern and western cities in Canada and the United States. The city is situated at the head of ocean naviga-

Grand Trunk Railway system—General offices, Montreal.

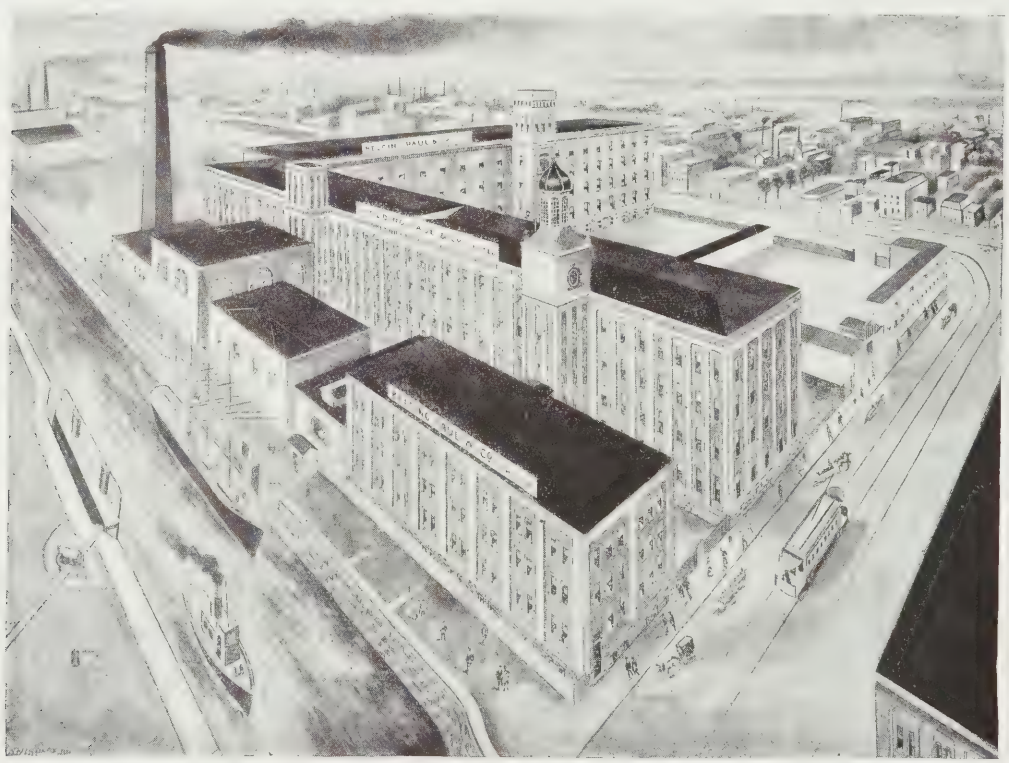
Grand Trunk Railway system—Victoria Bridge, Montreal.

Grand Trunk Railway system -Freight terminals, Montreal.

tion 900 miles from the Atlantic ocean. It is also most favourably located for the transhipment of cargoes from ports on the great lakes to European and the maritime ports of Canada. The commercial and material greatness of the city is evident to every visitor. The Board of Trade, Chamber of Commerce and other commercial institutions, comprised of capitalists, merchants, manufacturers, brokers, insurance men, steamship owners and agents and railway men, give their attention to local and foreign trade. The extensive new wharves of $7\frac{1}{8}$ miles, piers, sheds, cold stores, cattle sheds, grain elevators and grain conveyors from the elevators to the ships, railway sidings for tranferring freight, of the Harbour Commissioners, are of the most modern type. The Grand Trunk grain elevator piers, long enough for two ocean going vessels to load and railway sidings to the ship's side and to the elevator show the enterprise of this company and accommodation for handling freight.

The harbour is over 18 miles in length and presents during the season of navigation a scene of great activity.

The port is one about which a great deal of interest centres in connection with engineering skill and large expenditure on account of its geographical position. At one time an inland port at which vessels drawing only ten feet of water could reach from tidal waters, the ship channel now permits steamships drawing 28 feet of water and of 10,000 tons to ascend the St. Lawrence river and moor at her wharves. The distance between the seaport of Quebec and Montreal, by water, is about 167 statute miles and in this distance at many points dredging has been done through sand, clay, hard pan, shale and rock, for a distance of 70 miles with a width of from 500 to 800 feet at the bends, making a clear channel of the whole distance. Some dredging has been done below Quebec in the new project of the 35 foot channel and when the whole channel is completed, vessels of 15, 000 tons will be able to reach Montreal from sea. The channel for the whole distance is lighted with acetylene buoys and lighthouses making it the best lighted channel for the distance in the world. Immediately above Montreal is the Lachine canal, the Soulanges canal



and the Beauharnois canal on the St. Lawrence River, through which vessels from the great lakes are locked. Another wonderful piece of engineering skill is the Victoria Jubilee bridge across the St. Lawrence, 2 miles in length and once considered one of the wonders of the world.

Manufacturing in all kinds of heavy and light merchandise is carried on in various parts of the city and suburbs, on a large scale.

The learned find institutions that cannot fail to suggest to them the ambition of the inhabitants to make this place a seat of learning. McGill University occupies extensive grounds and the college buildings are pretentious in architecture, and spacious, but still too limited to accommodate the number who seek admission from every quarter. Princely gifts of former and present citizens have contributed to the erection and equipment of buildings of the most modern types and appliances, and, within their walls are valuable collections of human art. Chairs have been endowed and are maintained of professorships and lecturerships, in the faculties of Art, Applied Science, Medicine, Law, Comparative Medicine and Veterinary Science. It has no superior in the qeuipment of engineering, electrical and mechanical and technical departments.

Laval University is to the French of Canada what McGill is to the English. It is one of the best classical institutions in America; a school of philosophy and the Grand Seminary are connected. The buildings are substantial but the grounds are not so extensive as those of McGill University. From Laval University priests of the Roman Cathiolc faith go forth to various dioceses on the Continent.

The pious find in Montreal some of the largest churches to be found on the continent, containing altars of great dimensions wonderfully ornamented, paintings of masters adorning the walls and stained windows of great beauty and variety of colour, niches with statuary and costly founts. Notre Dame church will seat 4,000 persons. St. James cathedral is of still larger dimensions externally; it was built after St. Peters at Rome. The Protestant churches are also numerous, among them being St. James Methodist church, one of the largest Protestant churches in the world.

Grand Trunk Buildings.

The Grand Trunk Railway has erected within ten years two ten-story office buildings made necessary by the expansion of its business. At Bonaventure Station, every few minutes trains are despatched to cities and villages in eastern Canada and also make connections with the most important railroads on the continent.

Cornwall, Prescott and Brockville.

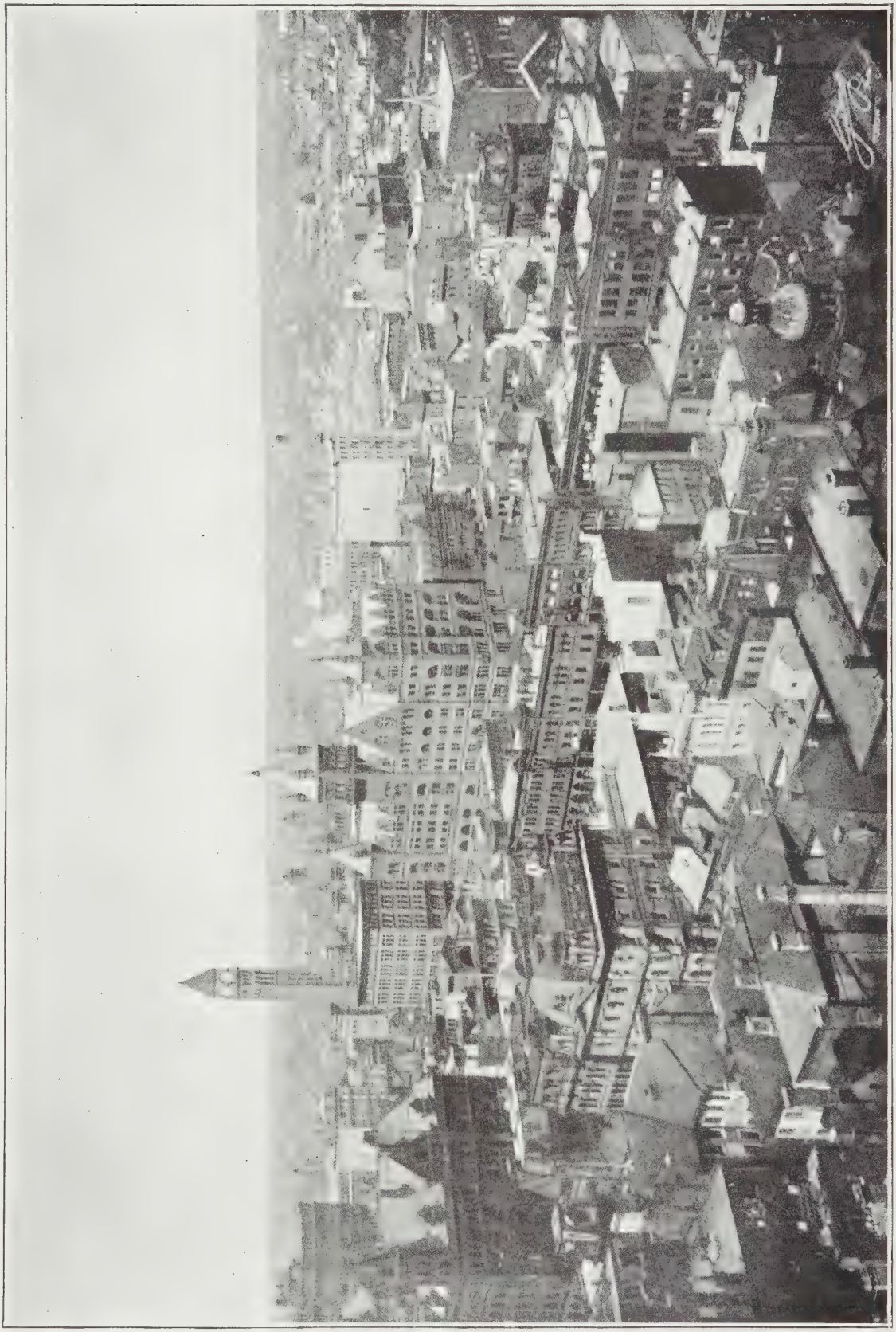
From Montreal, the line continues westerly through the thickly settled country above Montreal along the north shore of the St. Lawrence river, continuing along the upper St. Lawrence valley and entering the favourably situated towns of Cornwall, noted for its woollen and cotton mills, $67\frac{1}{2}$ miles from Montreal; to Prescott, the location of a Government buoy and lighthouse depot, $113\frac{3}{4}$ miles from Montreal; to Brockville, a beautiful town on the banks of the St. Lawrence, $125\frac{3}{4}$ miles from Montreal; to Thousand Island Junction, 154 miles from Montreal. From this point a branch line conveys the traveller and sightseer to the beautiful panorama of the Thousand Islands. Many of these islands are still in their natural state, with shores of rock and gravel; the islands still maintain much of their original growth of trees and sections of later growths, interspersed with patches of green meadow. Most of the islands, on the other hand, bear constructions, from the simple cottage and bungalow to the castellated residences of wealthy owners, and commodious hotels.

Thousand Island Junction.

Kingston.

The railway continues along the St. Lawrence valley to Kingston at the foot of Lake Ontario, $175\frac{1}{4}$ miles from Montreal. This city named the "Limestone City," is the seat of Queen's University and a Military College, and here is located a Provincial Penitentiary. From Kingston, the line continues westerly through the thickly settled country along the north shore of Lake Ontario, entering various towns and on to the picturesquely situated towns of Belleville, 220 miles from Montreal, Cobourg and Port Hope, respectively 264 and $270\frac{3}{4}$

Belleville, Cobourg and Port Hope.



Birds-eye-view of Toronto, from the spire of St. James Cathedral.

G. T. Ry. system—Car ferry—Cobourg and Port Rochester.

miles, from Montreal, to Toronto 334 miles from the metropolis.

This progressive and central city, contains several fine public structures, university buildings, splendid private residences, numerous well appointed hotels and has a capacious and well sheltered harbour. On the island, which forms the southern confines of this harbour, several parks and amusement resorts form attractive places for the inhabitants and visitors. At this city is located an extensive area on the shore of Lake Ontario, upon which are constructed buildings devoted to the exhibition of agricultural and manufactured products, exhibits of machinery and merchandise, and buildings specially arranged to contain exhibits of the fine arts and sciences. The annual Dominion Exhibition and Fair attracts visitors from all over the continent and parts of Europe. Exhibitors are not confined to Canada but European and United States manufacturers also, display their goods.

Toronto.

Toronto is the Mecca of excursionists to Canada, for rarely a day in summer passes without bringing to this central point, by the superb Grand Trunk railway, through trains and by local trains, thousands of visitors from the south, north, east and west. The Union Station is a scene of passenger traffic unequalled in the country.

The city is modern in its appearance and well up to date in all respects, containing the most extensive dry goods retail establishments in Canada.

The line runs westerly to Hamilton $38\frac{3}{4}$ miles from Toronto, through a country of peach and apple orchards, vineyards and fruit gardens. Hamilton is an enterprising city of considerable manufacturing importance, located at the extreme western end of Lake Ontario. It possesses a spacious harbour inside the bar, called Burlington Beach, over which the waters of the Lake flow. Its railway importance is indicated by the large number of trains, which daily pass through and stop at the station. Several good hotels in the city, furnish first class accommodation to the travelling public, who make this place a favourite resort.

Hamilton.

The line continues south from Hamilton passing through the fertile Niagara peninsula to Grimsby and St. Catharines then to Niagara Falls $82\frac{1}{4}$ miles from Toronto. The Falls are so well known that it is not necessary to recapitulate the scenes about this great cataract beyond stating that it is one of the wonders of the world. From the Grand Trunk steel arch double track bridge, spanning the gorge where the world famous suspension bridge formerly stood, a panoramic view of this great waterfall at the town of Niagara Falls, Ontario, can be obtained. Several hotels and one spacious one, afford accommodation for the large number of observers and travellers, who visit this place.

Grimsby, St. Catharines and Niagara Falls.

From Niagara Falls the line proceeds to Buffalo where it has

Buffalo.

Grand Trunk Ry. system—Brantford, Ont.

Grand Trunk Railway system—Hamilton, Ont.

connection with all the railways of New York and eastern and south bound trains in the United States.

Returning to Hamilton, the traveller is conveyed to London, another beautiful city, 118½ miles from Toronto, and on to Sarnia, 177¼ miles from Toronto where the line forms a junction with the direct line to Sarnia from Toronto. Here a branch deflects to Windsor, Ontario, and Detroit, Mich, 229 miles from Toronto and 571½ miles from Montreal.

London, Ont.

Sarnia.

The St. Clair tunnel at Sarnia extends beneath the St. Clair river, connecting Port Huron, Mich., with Sarnia. The tunnel is looked upon as an extraordinary work of rare engineering skill and enterprise; it was constructed at a cost of $2,700,000. It is a tubular structure of iron, bolted together in sections, and with its approaches, is nearly two miles in length. It overcomes the obstacles of a navigable stream carrying fleets of freight and passenger vessels during the summer and blocked with ice during winter. The tunnel is lighted by electricity, powerful motors perform the service of drawing the trains, smoothly, quickly and cleanly hrough the tunnel. Sarnia and Point Edward are active business centres and near the oil regions of Petrolia. From Port Huron the line continues to Chicago, 514¼ miles from Toronto and 840½ miles from Montreal.

Tunnel at Sarnia.

Point Edward.

From Toronto the line has its branches radiating to the northern and northwestern parts of Ontario; in the one drection to the pros-

Port Huron and Chicago.

Grand Trunk Ry. system—Steel arch bridge across Niagara gorge.

Canadian Westinghouse Co., Ltd., Hamilton, Ont.

perous towns of Goderich, 134 miles from Toronto, Kincardine, 156 miles from Toronto and Southampton, summer resorts on Lake Huron; in another direction to the thriving towns of Wiarton, Owen Sound, Meaford, Collingwood, Penetanguishene, Midland and Depot Harbour or Parry Sound, on Georgian Bay.

Goderich Southampton and Kincardine.

At Collingwood, a shipbuilding plant and yards construct large iron vessels of various descriptions, from the handsome passenger boats of the latest practice, to the huge grain vessels which ply the lakes.

Midland. Midland has a fine harbour the town contains a large smelting plant and near it is the large Grand Trunk grain elevator at Tiffin.

Depot Harbour. Depot Harbour has also a fine harbour, good wharves and well equipped grain elevators.

Steamboat connections are made at Sarnia, at the southern end of Lake Huron, with the Northern Navigation Company's steamers. These steamers are among the finest and fastest on fresh water, being well furnished, equipped and withal fine seaworthy vessels. They have been built at great cost, with a view of providing accommodation for all classes of passengers. The route from Sarnia is the whole length of the lake, and the steamboats are at times out of sight of land on this inland sea. The change from land travelling to a fresh water "sea voyage", in these handsome and commodious boats, is enjoyed by travellors who are always intensely interested in the variety of shore line along the lake, and on the numerous islands at the north end of the lake. The steamers pass through the great locks at Sault Ste. Marie and continue across Lake Superior, the largest body of fresh water on the continent, to the busy ports of Fort William and Port Arthur, the gateway of the Canadian prairie country.

Steamboat connection on Lake Huron.

Sault Ste. Marie and Lake Superior.

Fort William and Port Arthur.

At Owen Sound, Georgian Bay, the Grand Trunk also makes connection with the steamers of the Northern Navigation Company which pass up the North Channel or St. Mary's river. This river presents a wonderful variety of landscape and charming scenes, numerous well wooded islands and waters that descend from Lake Superior. This trip also includes a voyage across Lake Superior to Port Arthur and Fort William. Connections are also made with an excursion steamer at Georgian Bay ports, and trips are made through the sinuosities of the channels of the wonderful Bay of the 30,000 islands.

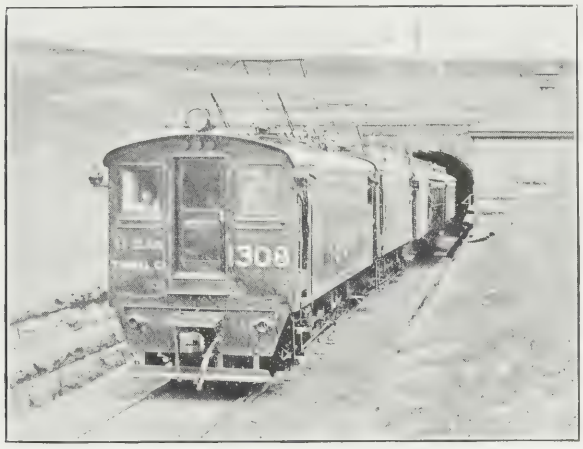
Muskoka lakes, in the "Highlands of Ontario", are also reached by the northbound trains from Toronto, which leave their passengers at Gravenhurst and Muskoka wharf, 112 miles from Toronto. The Muskoka lakes have become a great attraction to visitors from every quarter. The bracing and health giving air has drawn many invalids to its shores for the restoration of health. Numerous hotels from first class and spacious hostelries to hotels that suit the traveller of more moderate means, are found at every few miles. The grandeur of natural scenery, and the peculiar and striking multiplicity of islands, clothed with forest growth of pine and other evergreen trees, and the deciduous trees giving variety to the foliage, make these lakes an exceptionally favorite place. Passenger steamers and motor boats ply on their beautiful clear waters and present a most lively scene of holiday visitors taking advantage of nature's means of recuperation and enjoyment. Splendid Grand Trunk trains, with every modern equipment for ease and comfort, continually arrive and depart from this great resort.

Muskoka Lakes.

An important branch, extensively travelled, runs to North Bay on Lake Nipissing, 227 miles from Toronto, and here connects with all trains running north, east and west at this centre of immense traffic. The Grand Trunk also connects at this point with the Temiscamingue and Ontario Railway, a Provincial line, which begins at North Bay and runs to Timagami lake, 72 miles from North Bay. This lake is a gem not surpassed on the Continent and

North Bay

Timagami Lake.



G. T. Ry. system—St. Clair tunnel—Coming out of tunnel.

Grand Trunk Railway system near Stanley House—Lake Joseph, Muskoka Lakes district.

Grand Trunk Railway system—Wa-wa Hotel, Lake of the Bays, Ontario.

Grand Trunk Railway system—Rabbits Bay.

Grand Trunk Railway system—Cache Lake.

is in the midst of Timagami Reserve. The lake retains all ita natural features as the Provincial Government has reserved it as a natural Reserve from which the lumberman and agricultural settlers are excluded. Timagami station is picturesquely situated at one end of the lake, and a commodious hotel here furnishes excellent accommodation for tourists, sportsmen and canoeists. Fish and game abound; the tourist of moderate means and the wealthy find, at convenient distances, hotels of surprising size and peculiar designs, furnishing all the comforts of life.

The T.N.O. Railway proceeds to Cobalt, the centre of the great silver mining district and 103 miles from North Bay, then enters the productive clay belt of new Ontario at Haileybury 108 miles from North Bay, and proceeds through the great forest section, where large game abounds and excellent fishing is obtained in the numerous streams and lakes, to the new town of Cochrane, 253 miles from North Bay. Here a junction is formed with the new Grand Trunk Pacific Transcontinental Railway.

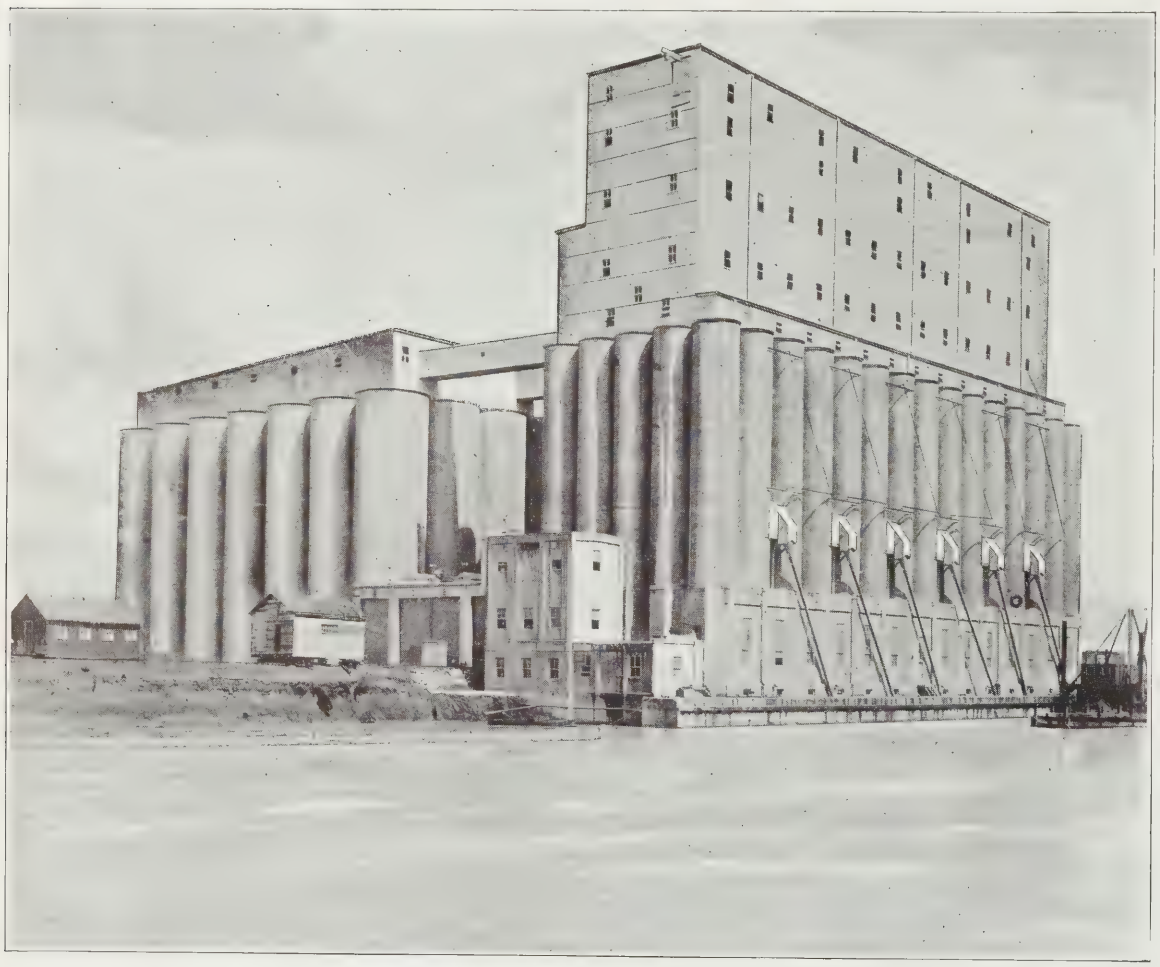
Cobalt.

Haileybury.

Cochrane.

In the Ottawa Division, the main line continues from Montreal and connects at Coteau Junction with the line to Ottawa, the capital of Canada and 116¼ miles from the commercial metropolis. The Capital is the gem of Canada; here the Parliament buildings are situated on a promontory affording one of the

Ottawa and Parliament Buildings.



Grand Trunk Pacific Railway—Elevators at Fort William Ont.

most superb, and varied in outline, views to be found in any capital of the world. The Parliament buildings are of intense architectural interest, and their location enhances their majestic appearance whether seen from nearby or at a distance. One Governor General, who had seen the world, lately stated that he felt like taking off his hat every time he looked upon them from any point of view. In keeping with the architectural beauty of these buildings is the new Grand Trunk hotel, "Chateau Laurier," which including its appointments is pronounced as the finest hotel building on this continent. Built on Major Hill Park, it is a companion building to the Government buildings across the ravine formed by the Rideau Canal.

Chateau Laurier.

The new Grand Trunk Railway station, on the opposite side of the new Plaza, is also a handsome building, with its capitals supported by huge corinthian columns of light-coloured stone. The whole building and its train entrance, presenting a strikingly handsome and unique structure.

Grand Trunk Station, Ottawa.

Grand Trunk Ry. system—Station at Ottawa.

The rapid progress in ornamenting and beautifying the city, by the efforts of the Government Commission, has resulted in a transformation of various and large sections of the capital. The driveway along the canal bank to the Experimental Farm, is now the finest in Canada and its extension is occupying the attention of the commission and the civic authorities. Ottawa's numerous nearby resorts afford pleasure and amusement to its inhabitants.

Driveway, Ottawa.

Grand Trunk Ry. system—Algonquin National Park —Fishing on Pettawa River.

In Ottawa is situated the Geological Museum of Canada, another fine and handsome building. The Mint and Archives, on the banks of the Ottawa river, claim also the visitor's attention. With the opening of the "Chateau Laurier" ample hotel accommodation will be found in the city by excursionists, deputations to interview the Government and conventions of various kinds. The New Russell is situated about 3 minutes walk from the Grand Trunk station. The Grand Union, Windsor and Cecil are within easy distance of the same station.

The Chaudiere Falls and rapids above form a scene of grandeur unequalled in Ontario. The whole volume of water of the Ottawa river passes over the Chaudiere Falls. Two of the most im-

Grand Trunk Railway system—On the Maganatawan River.

Grand Trunk Ry. system—Portion of the City of Ottawa, showing the new $2,000,000 Grand Trunk hotel, the "Chateau Laurier" and station.

portant industries of Canada are established at these Falls and power is obtained for electric light plants, water works and minor industries. Hull, immediately opposite Ottawa, contains varied and large industries. The interprovincial and suspension bridges connect the two cities. The river forms the boundary between the provinces of Ontario and Quebec.

From Ottawa the line continues to Parry Sound, 261 miles from Ottawa and thence to Depot Harbour on Georgian Bay, $263\frac{3}{4}$ miles from the Capital. The trains on this line carry the tourist through the famous Algonquin or National Park of Ontario. "This park is a reservation of over two thousand square miles, set apart by the Ontario Government for all time to come, for the benefit and enjoyment of the people." It is one of the most remarkable regions of lake and stream, primeval forest and rock that can be found anywhere. It is a great game preserve and a fisherman's paradise. At Scotia Junction on this line $213\frac{1}{4}$ miles from Ottawa, the Parry Sound and North Bay lines cross each other.

Parry Sound Branch.

Algonquin Park.

Scotia Junction.

This description of the Grand Trunk Railway system is confined to the main lines and consequently the numerous branches in Ontario are not mentioned.

FEATURES OF THE ROAD, TRAINS AND FERRIES.

The Grand Trunk is now the longest continuous double track railway in the world, under one management, namely from Montreal to Niagara Falls and to Chicago. The steel rails on this line are 100 pounds to the yard. The International Limited trains start from Chicago and

take in Detroit, Toronto, Montreal, Portland, Boston, and New York.

International Limited Trains.

The International Limited trains 3 and 4 consist of first class combination baggage car, first class day coaches, parlor library car between Montreal and Detroit, dining car between Montreal and London, Pullman sleeping car Montreal to Chicago, and Pullman sleeping cars Detroit to Chicago, the train being hauled by the Grand Trunk's powerful standard passenger engines of the latest type.

Windsor and Detroit Ferry.

Ferry steamers conveying trains cross the Detroit river between Windsor and Detroit. The Grand Trunk Railway was the pioneer system in Ontario and has now under construction the stupendous Grand Trunk Pacific Railway from Moncton, New Brunswick to Prince Rupert, British Columbia, and including branches from Moncton to Halifax Nova Scotia and St. John, New Brunswick.

GRAND TRUNK FARES.

The following fares will undoubtedly be in effect during the summer season of 1912 (any variations from the figures named herein will be slight).

From Toronto, Detroit, Chicago, Duluth to San Francisco, Los Angeles, San Diego and return via direct routes: (*a*) $73.75, $70.00, $65.00; (*b*) $92.95, $82.50, $72.50, $79.50.

From Toronto, Detroit, Chicago, Duluth to San Francisco and return via Portland, Ore., in one direction: (*a*) $85.55, $85.00, $80.00; (*b*) $102.60, $97.50, $87.50, $84.75.

From Toronto, Detroit, Chicago, Duluth to Portland, Seattle, Tacoma, Victoria, Vancouver and return: (*a*) $75.60, (*a*) $70.00, $65.00; (*b*) $87.60, $82.50, $72.50, $60.00.

From Toronto, Detroit, Chicago, Duluth to Winnipeg and return: (*c*) $50.00, $50.00, $40.10, $21.50; (*d*) $55.00, $55.00.

From Toronto, Detroit to Edmonton and return: $80.00, $80.00.

From Chicago, Duluth to Gardiner, Mont., and return (Yellowstone Park): $44.50, $32.00.

(*a*) In effect June 12-20 inclusive, final limit Aug. 12, 1912.
(*b*) In effect June 1 to Sept. 30 inclusive, final limit Oct. 31, 1912.
(*z*) In effect June 3 to 6 inclusive, final limit July 27, 1912; in effect June 27 to July 5 inclusive, final limit Aug. 27, 1912; in effect July 11 and 12 inclusive, final limit Sept. 11, 1912.
(*c*) Going and returning same all rail route.
(*d*) Good in one direction via Sarnia and Lake Route.

PARTIES OF 10 OR MORE.

From Chicago to Detroit, Mich., $5.00; Sarnia, Ont., $6.65; Toronto, Ont., $10.00; Muskoka Wharf, Ont., $11.50; North Bay, Ont., $13.00; Timagami, Ont., $15.25; Cobalt, Ont., $15.85; Kingston, Ont., $13.20; Prescott, Ont., $14.30; Ottawa, Ont., $15.05; Montreal, Que., $16.65.

From Detroit to Sarnia, Ont., $1.30; Toronto, Ont., $4.55; Muskoka Wharf, Ont., $6.20; North Bay, Ont., $8.55; Timagami, Ont., $10.00; Cobalt, Ont., $10.55; Kingston, Ont., $7.80; Prescott, Ont., $8.95; Ottawa, Ont., $9.65; Montreal, Que., $11.20.

From Toronto to Detroit, Mich., (r.t.) $4.20; Sarnia, Ont., (r.t.) $3.40-$6.80; Muskoka Wharf, Ont., (r.t.) $2.30, *z*$4.55; North Bay, Ont., (r.t.) $4.55, *z*$9.10; Timagami, Ont., (r.t.) $6.00, *z*$13.20; Cobalt, Ont., (r.t.) $6.60; Kingston, Ont., (r.t.) $3.30, *z*$6.55; Prescott, Ont., (r.t.) $4.40-$8.80; Ottawa, Ont., (r.t.) $5.15-$10.30; Montreal, Que., (r.t.) $6.70-$13.35.

From Niagara Falls, N.Y. to Detroit, Mich., (r.t.) $4.69; Sarnia, Ont., (r.t.) $3.74-$7.45; Toronto, Ont., (r.t.) $1.84; Muskoka Wharf, Ont., (r.t.) $3.84, *z*$6.90; North Bay, Ont., $6.14, *z*$11.45; Timagami, Ont., $7.59; Cobalt, Ont., $8.19, $15.80; Kingston, Ont., $5.04; $8.70; Prescott, Ont., $5.79-$10.35; Ottawa, Ont., $6.95-$13.60; Montreal, Que., $8.00-$13.70.

These fares apply for parties of ten or more except where indicated by *z*. They are also available for individuals.

FARES VIA GRAND TRUNK PACIFIC COAST STEAMSHIPS.

From Seattle to Prince Rupert and return, $36.00.
From Victoria to Prince Rupert and return, $32.00.
From Vancouver to Prince Rupert and return, $32.00.

In many instances the sale of through tickets is authorized to Prince Rupert by connecting lines, the round trip fares being made by the addition of the round trip fares quoted herein from Vancouver to the authorized fares to Seattle, Victoria or Vancouver, tickets being issued via any one of these junction points.

TRANSCONTINENTAL RAILWAY.

GRAND TRUNK PACIFIC RAILWAY.

Moncton.

Moncton, N.B., is the eastern terminus of this line. It equals if not surpasses in magnitude any plan of railway construction hitherto undertaken as a whole. Two branch lines run from Moncton; one to Halifax 185 miles from Moncton, the other to St. John 89 miles from the eastern terminus.

Halifax and St. John.

From Moncton the line will run through part of New Brunswick, the province of Quebec and new Ontario to Westport near Fort William at the head of Lake Superior, from there to Winnipeg.

Grank Trunk Railway system—The International Limited.

Manitoba. Part of this line has been constructed from Moncton and the portion from Westport to Winnipeg will be in operation during the summer of 1912. From Winnipeg the line is now in operation to Edson, Alberta, a distance of 922 miles. From the rapidly growing city of Winnipeg the country is prairie and well adapted for the growth of all kinds of grain. This land which is now being rapidly taken up produces rich crops the first year of cultivation.

Winnipeg.

Edson, Alberta.

Many flourishing towns and cities are located on the line among which are Rivers, Melville, Watrous, Saskatoon, Biggar, Wainwright and Edmonton. At Watrous is found the wonderful "Manitou Lake", whose waters contain medicinal properties that are fast bringing the attention of the world to this fact. Wainwright has the National Buffalo Park, where are corraled in an area of 100,000 acres surrounded by 75 miles of wire fencing, the largest and only remaining herd of Buffalo in existence.

Edmonton and other Towns.

Nearly 1,000 of these animals are in captivity at this point. Saskatoon is a prosperous go-head city with a population of nearly 15,000 people, and Edmonton, with a population of 30,000, is the capital of Alberta, and one of the coming cities of Western Canada.

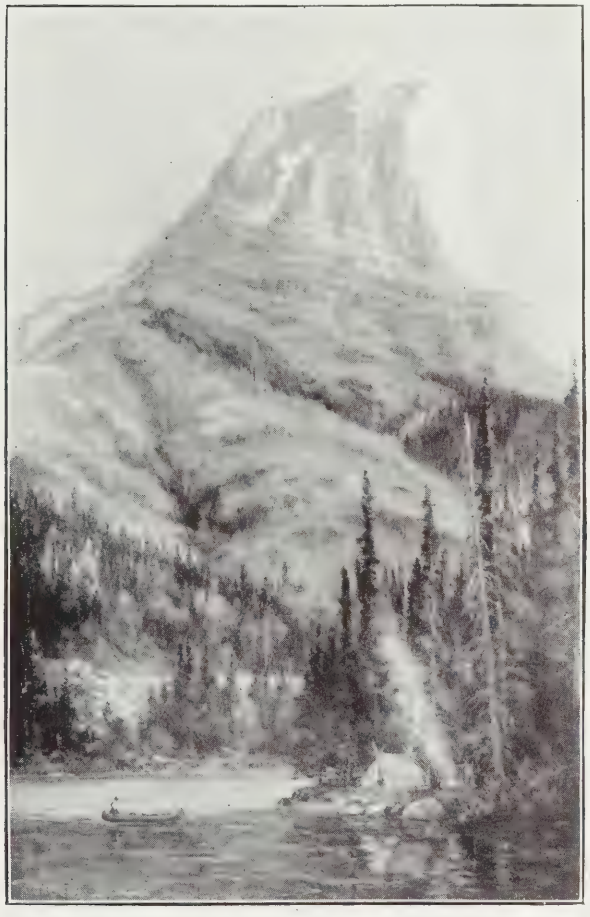
The Buffalo Animals.

The "Last Wonderland", is that portion of Canada, Edmonton to Fort George. This is a land abounding in big things, a vast and hitherto unknown section, in the central and north western part of western Canada,

Fort George.

Grand Trunk Pacific Ry.—Canadian Rockies, Mount Kitselas.

Grand Trunk Pacific Railway—Snowshoe Mountain Skeena River, B.C.



Grand Trunk Pacific Railway—Roche Mietle, from Athabaska River

Grand Trunk Pacific Railway. Co.—Moose Lake, Canadian Rockies.

Grand Trunk Railway system—Hotel Fort Garry, Winnipeg.

Grand Trunk Pacific Railway Co.—Mount Robson—Altitude, 13,700.

probably the most wild and romantic region on the American continent.

So little was known of this section that the early explorers who were pioneering and path-finding for the Grand Trunk Pacific found waterfalls higher than Niagara, actually unknown. They also found rivers, mighty rivers, wide and deep, that were from 50 to 100 miles out of place on the map.

When they had finished blazing the trail, they found that it wound away by the foot of Mount Robson, which, according to Government authorities, is the highest mountain in the Canadian Rockies. Despite the fact that they were able to lay an almost level line from the Atlantic to the Pacific, they found that they were travelling through some of the grandest scenery to be found anywhere in the world.

Other surprises have followed in the wake of the path-finders. They found, as the prospectors followed the trail-blazers, vast areas of the richest agricultural valley-lands, rich deposits of silver and gold, great fields of coal, and forests of fine timber. They found, in short, a country so rich in resources as to insure an abundance of traffic for the splendid railway that has been designed. They found rugged wilds literally alive with big game, together with rivers and lakes full of fish.

The Grand Trunk Pacific railway have acquired land in Winnipeg and Edmonton on which will be erected mammoth hotel structures that will rival any now in Canada. The name of the Winnipeg hotel will be "The Fort Garry", the name for the Edmonton one has not yet been decided.

Mountain Hotels.

A chain of mountain hotels has also been decided upon and the site for the first of these has already been chosen, at the Miette Hot Springs.

PRINCE RUPERT.

BRITISH COLUMBIA.

In the western half of this new world there is scarcely a city that does not hold one or more citizens who can boast of having seen the place grow from a village to what it is to-day, but here, at the western end of the Grand Trunk Pacific railway, we have the rare opportunity of

Grand Trunk Pacific Railway Company—Entrance to Yellowhead Pass.

looking forward and fashioning in our mind's eye a city sure to be.

Prince Rupert the western terminus is situated 550 miles north of Vancouver and forty miles south of the Alaskan boundary. It is in the same latitude as London, and has a climate, the mean temperature of which is about the same as that of the metropolis of the British Isles.

The selection of the Pacific coast terminus was one of the most important tasks with which the builders of this national highway had to do. Many things must be considered. It must have a harbour second to none, and lie where the rails could reach it without seriously lengthening the line, or increasing the gradients. The entire north coast was searched, and every harbour sounded before a final decision was made. The very satisfactory result is that the future metropolis of the north coast will look out upon a harbour that is all that could be hoped for. Although practically land locked, it has a mile-wide channel, and is sufficient in size to shelter all the ships that are likely to come to it, great as are the possibilities of this new port.

And because Prince Rupert is at the end of the line, and the nearest port to Japan and the East; because it is on the shortest line from Liverpool to Yokohama, the shortest route around the world, it is bound to lie on the

All Red Route.

The city was planned in advance of any building, and nothing was overlooked which could add to the beauty and symmetry of this city to be.

Summer Cruises in Northern Seas.

With the improvement in transportation facilities in the western wonderland of America, and especially with the inauguration of the North Pacific coast service of the Grand Trunk Pacific, Steamships between Puget sound and Northern British Columbia, including the Portland canal and glaciers, the Canadian traveller can find little to justify a trans-Atlantic or other trip abroad for pleasure, health or sightseeing, unless he has already thoroughly exhausted the wonders and enjoyment of the greatest change and panorama of North America, if not of any hemisphere.

Grand Trunk Pacific Steamships

The handsome buildings, rising tier upon tier on the splendid terraced streets of busy, hustling Seattle; the quaint, unique charms of Victoria, the beautiful capital of British Columbia, mixed with its rapidly growing business consequence; the substantial new city of Vancouver, throbbing with busy enterprise forging ahead as one of the chief ports and cities of the Pacific coast; the latest of all cities, Prince Rupert, the terminus on the Pacific ocean of the Grand Trunk Pacific transcontinental line, situated on a harbour with perhaps not an equal in the world for beauty and practical use; the new mining city of Stewart, surrounded by glacier capped mountains, a continuation of the views along the Alaskan coast which the vessel follows for a hundred miles; but above all in its appeal to the rest-hunter and sight-seeker the trip of two thousand miles on the palatial steamships "Prince Rupert" and "Prince George' —by far the finest in the North Pacific coast service—and on the Company's steamers operating between Prince Rupert and Portland canal and Queen Charlotte islands.

Seattle, Victoria, Vancouver.

Prince Rupert.

Stewart.

Norwegian fjords are justly famous but the British Columbia coast embraces in its canals and inlets, mountain girt, all the Norwegian attractions and more.

Along the route of the Grand Trunk Pacific steamships, the sheltered waters of the Pacific ocean are traversed for over eight hundred and fifty of the nine hundred miles from Seattle to Stewart, via Victoria, Vancouver and Prince Rupert.

Beautiful mountain ranges, many snow-capped, extend the entire distance, sometimes viewed on either side of comparatively wide stretches of water, but for the most part rising abruptly from the canal-like or island-studded course of the steamships.

CANADIAN PACIFIC RAILWAY.

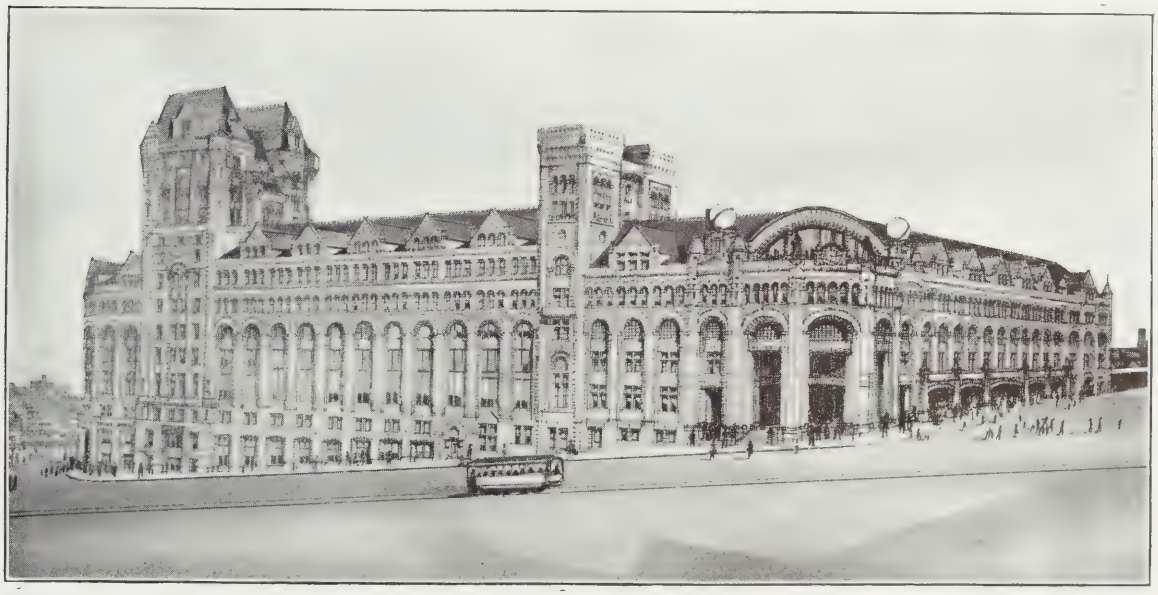
The Canadian Pacific Railway was the first transcontinental railway built in Canada. The company has always shown the greatest enterprise, and was the path-finder through the Rocky mountains in Alberta and British Columbia. The Company has built splendid hotels, established steamboat lines on the Pacific and Atlantic oceans, on Georgian bay, Lake Superior and the inland waters of British Columbia, by which alternate routes are given its passengers and connections are made with its railway lines and branches.

Montreal.

Montreal is the headquarters of the line and from this city, the line east and west connects the Atlantic ocean with the Pacific. The Windsor station where Canadian Pacific trains enter, exclusively at Montreal is one of the finest in Canada. The Place Viger, another station has connected with it a first class hotel convenient to all parts of the city.

Montreal is the largest city in Canada and second only to Quebec in historical interest. It ranks amongst the most beautiful cities on the American continent, and presents all the aspects and elements of metropolitan life, with evidence of material wealth and prosperity on every hand. Yet in the midst of the bustle of the city's commerce are huge gray monasteries and convents and stately cathedrals, which rival the grandest edifices of Europe in splendor and historic interest. Montreal is pre-eminently a city of churches,—French, English, Protestant and Catholic. Mount Royal, from which the city takes its name, affords a delightful drive, and from its summit is seen the grandest panorama of the picturesque valleys of the St. Lawrence and Ottawa rivers that is obtainable. A run down the Lachine rapids is an enjoyable experience. They were first run by a steamer in the summer of 1840 by the side wheeler "Ontario" afterwards known as the "Lord Sydenham." Running these rapids is a most exciting experience and steamers descend daily during the summer.

Not only is Montreal the headquarters of the biggest railway in the Dominion of Canada, but it is also the key to the great waterways of Canada. Montreal's trade with foreign countries has grown very fast these last few years, the short route to Europe, via the St. Lawrence, meeting with the universal approval of trader and passenger alike. Montreal has extensive harbour accommodations with over seven miles of deep water wharfage and is connected with Lake Superior by canal system. During the



Canadian Pacific Railway Company—Windsor Street Station, Montreal.

Canadian Pacific Ry. Co. hotel system—Place Viger Hotel, Montreal.

Canadian Pacific Railway Co.—Montmorency Falls, near Quebec.

An Atlantic Empress approaching Quebec—C. P. Ry. Co. Atlantic S. S. service.

Canadian Pacific Railway Company—Angus shops, Montreal.

summer, ocean steamships run from Montreal to Liverpool, Glasgow, London, Havre, Havana, Cape Town, Bristol, Antwerp, Belfast, Dublin, Cardiff, Manchester, Leith and Aberdeen. Besides the C.P.R. there are eleven other ocean steamship companies running into Montreal.

In connection with large ocean traffic the following table found on the walls of the Canadian Rubber Company's works on Notre Dame street, records this interesting fact: "1829–1833. The Pioneer of Steam Navigation. On this site stood Bennett and Henderson's foundry, in which were erected the two engines designed and placed by John Bennett on the 'Royal William'—the first vessel to cross the Atlantic or any ocean entirely propelled by steam."

From Montreal to Quebec, the line runs along the north shore of the St. Lawrence river touching at important cities, towns and villages on the way to the ancient capital. Mile End, the first station reached is 5 miles from the centre of Montreal and St. Martin junction 13 miles. A branch diverges at Lanoraie, 50 miles from Montreal northward to Joliette.

Three Rivers, a flourishing manufacturing city and ocean port, is 96 miles from Montreal.

Three Rivers.

Piles junction is two miles further on and near St. Maurice where the river St. Maurice enters the St. Lawrence. The St. Maurice river furnishes immense water power to several large manufacturing industries, and nature's aids to manufacturing cannot fail to afford a most interesting view. A branch line runs to Grandes Piles, northward on the St. Maurice.

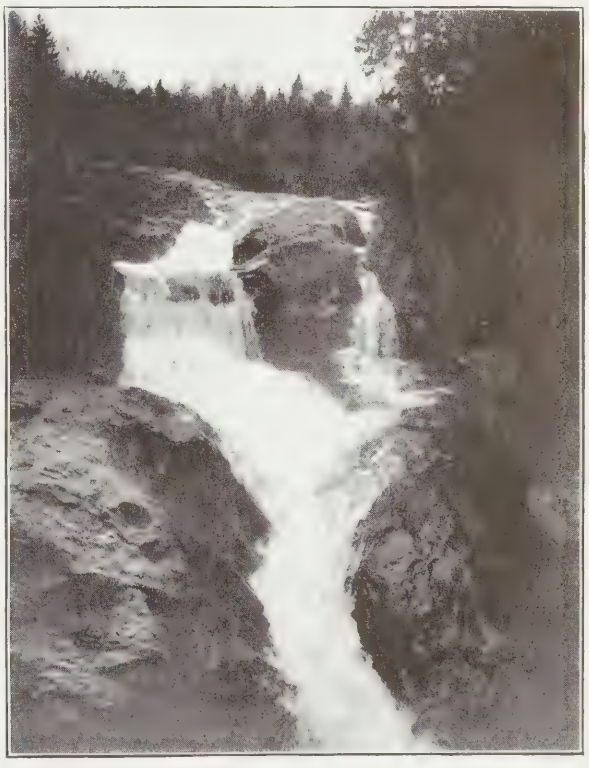
From Three Rivers, the line continues along the St. Lawrence to Quebec, 173 miles from Montreal.

The city of Quebec is a bit of mediaeval Europe placed in a Canadian setting. It is of

Quebec.

interest to shipping men because here it was that the ships of the early discoverers of the northern part of America first dropped anchor, and here European civilization was first planted. Quebec has seen stirring times. Here it was that the early French made their last fight for the Dominion of Canada, in the western world,—on the plains of Abraham where Wolfe and Montcalm fell. Here, in the harbour, fleets of warring nations have more than once belched fire and destruction. Quebec has gradually evolved from a military stronghold into a big commercial centre, but it has not yet lost the charm of its ancient associations. The air of old time antiquity still predominates. Here are beetling crags on which is perched the strong citadel once known as the Gibraltar of the St. Lawrence. Here are fine old monasteries and cathedrals, here are pleasant walks and drives, like that of Dufferin terrace. Here are the historical monuments and tablets, reminders of bygone days and here are quaint old streets.

Quebec has a fine harbour and a fine shipping trade. In the summer it is the port of entry for the big trans-Atlantic lines and the port of destination for the well known "Empress" steamships. It is always a point of rivalry as to which line shall make Quebec first in the Spring. The government employs ice breakers to clear the channel. Entrance to the port is



Canadian Pacific Ry.—Sault-a-la-Puce, near Quebec.

Canadian Pacific Railway Company hotel system—Chateau Frontenac, Quebec.

generally gained towards the end of April. Quebec is the shipping point for a great deal of the freight of the Maritime Provinces.

An interesting side trip from Quebec is that to the Falls of Montmorency, which are 100 feet higher than those of Niagara.

SHORT LINE.

ATLANTIC DIVISION.

Another important section of the Canadian Pacific Railway line is the Short Line, Atlantic Division, which passes through a part of the Province of Quebec via Farnham, 44 miles from Montreal. Several branches diverge to points north and south in the Eastern Townships. This section of country has been long famous as a splendid agricultural part of Canada, advanced in all respects, with many beautiful towns and villages. Lake Memphremagog is one of the principal summer resorts in this section and is a magnificent sheet of water, with rugged shores presenting an ever-changing scene of hills and cliffs and within the lake are numerous islands which add to to the beauty of the lake.

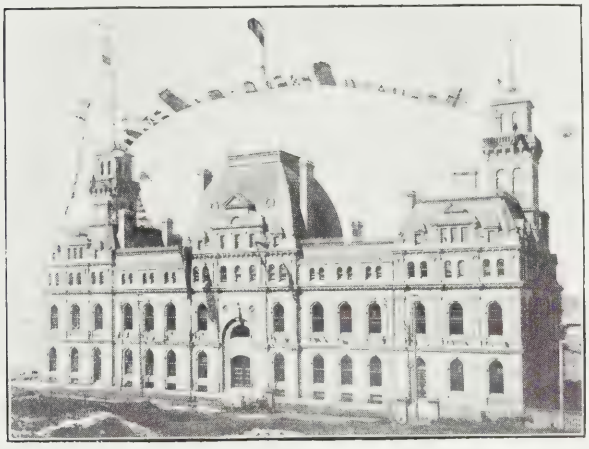
From the Eastern Townships, the line continues until it passes the boundary line of the Province of Quebec and enters the State of Maine. It then pursues its way to the boundary between Maine and the Province of New Brunswick. Several branch lines diverge from the main line in New Brunswick, one at McAdam junction, 399 miles from Montreal, runs to Edmunston 58 miles from McAdam junction. The line passes directly from McAdam to the beautiful city of Fredericton on the far famed St. John river, New Brunswick. Fredericton junction is 439 miles from Montreal. From this important place, the line runs direct to St. John, at the mouth

of the river of the same name, 483 miles from Montreal, and on the bay of Fundy.

St. John is a remarkably enterprising city and sea port. At this point the river emptying into the harbour falls over a cliff nearly

St. John.

30 feet high and the incoming tide which rises 28 feet causes a reversible fall at high tide. The port is now developing at a rapid rate, its wharves and sheds provide accomodation for large ocean going vessels and it is the winter port for several lines on the east coast of Canada. The Canadian Pacific Railway has at West St. John grain elevators and railway sidings to convey cattle and grain to ocean liners.



Custom House, St. John, N.B.

The Canadian Pacific Railway has connection by the Intercolonial Railway at St. John with Moncton, a converging point for other railways and 573 miles from Montreal.

Moncton is a most interesting town owing to its large railway workshops and Intercolonial Railway offices, and it also is a point of attraction on account of the "Bore" or high tide which flows from the Bay of Fundy up the Petitcodiac river, showing a wall of water as it ascends five feet in height and continues to rise at the rate of one foot every three minutes. From Moncton the Intercolonial proceeds to Halifax, 759 miles from Montreal. Halifax is well known as an ancient town

Halifax.

with most interesting and beautiful surroundings and places of historic interest. Until lately it was a naval station of the Imperial navy. The harbour is one of the finest in the world, spacious, of great length, completely land locked and would easily accomodate all the vessels of the British navy. The citadel is 127 feet above the sea and has an eventful history. It can accomodate the whole of the inhabitants of the town in the event of war. Halifax is an important port for ocean liners and has a large graving dock and a naval yard.

FROM MONTREAL WEST.

From Montreal the transcontinental line runs by two branches to Ottawa, 115 miles from Montreal. The branches are the North Shore Line and the Short Line, over the latter the transcontinental trains are despatched twice daily from Montreal. These trains are the Imperial limited and Soo trains. Ottawa is the political centre of the Dominion

Ottawa.

and is one of the most picturesque capitals in the world. The national buildings are the principal objects of interest to tourists, and its library is one of the most complete in the world. Ottawa is a city of charming drives and parks. The waters of the Ottawa which are here set between the provinces of

Halifax—Public Building.

Ontario and Quebec, pour over the Chaudiere falls—resembling in shape a huge cauldron or kettle. The Rideau falls are only half a mile distant.

Embraced in this district are the grandest of the innumerable northern lakes, whose very names are suggestive of romantic interest and beauty.

A direct line of the Canadian Pacific passes from Montreal to Toronto, 339 miles from Montreal. This important portion of the line passes through a country bordering on the St. Lawrence river and lake Ontario, along which are many enterprising cities and towns known for their beautiful location, surroundings and attractions of the rarest kinds.

Toronto has its attractions as a summer city. In point of size it is the second largest city in Canada. It is a metropolis of beautiful parks and magnificent private residences. With a harbour opening on lake Ontario, it has a thriving water traffic and almost at any time of the day the big lake steamers and freighters can be seen along the wharves. Throughout the province of Ontario are many pleasant summer resorts, chief among which are the Muskoka lakes and Kawartha lakes. During the summer months these sections are huge holiday centres for the city toilers of Ontario.

Toronto.

From Toronto the head of the Great Lakes is reached by taking the railway to Owen Sound and from there travelling to Fort William and Port Arthur via the C. P. R.'s palatial line of lake steamships. Owen Sound is a busy attractive town, progressive and enterprising. It has good stores and is surrounded by a very charming country.

Canadian Pacific Ry. Co.—Buckingham Falls in the Lievre River, Gatineau Valley.

Canadian Pacific Ry. Co.—New offices in Toronto.

It is a delightful trip through the 30,000 islands of Georgian Bay and Lake Huron, there being much that is interesting to be seen.

Taking up the transcontinental course of the railway from Ottawa it proceeds to North Bay

where the Grand Trunk and Ontario and Temiscaming lines have connection with the Canadian Pacific. Before passing from North Bay, three important branches should be mentioned which proceed from the main line and have their terminals in a most picturesque country, abounding with lakes noted for the fine fishing afforded sportsmen and tourists. The Gatineau valley branch from Ottawa passes through a country noted far and wide for its varied scenic effects. The rushing Gatineau river, on its way to the Ottawa river, contains many foaming rapids and the river winds its way at the foot of the Laurentian hills presenting diversified views that are unequalled in eastern Canada. This branch has its terminus at Maniwaki and passes through a well wooded country.

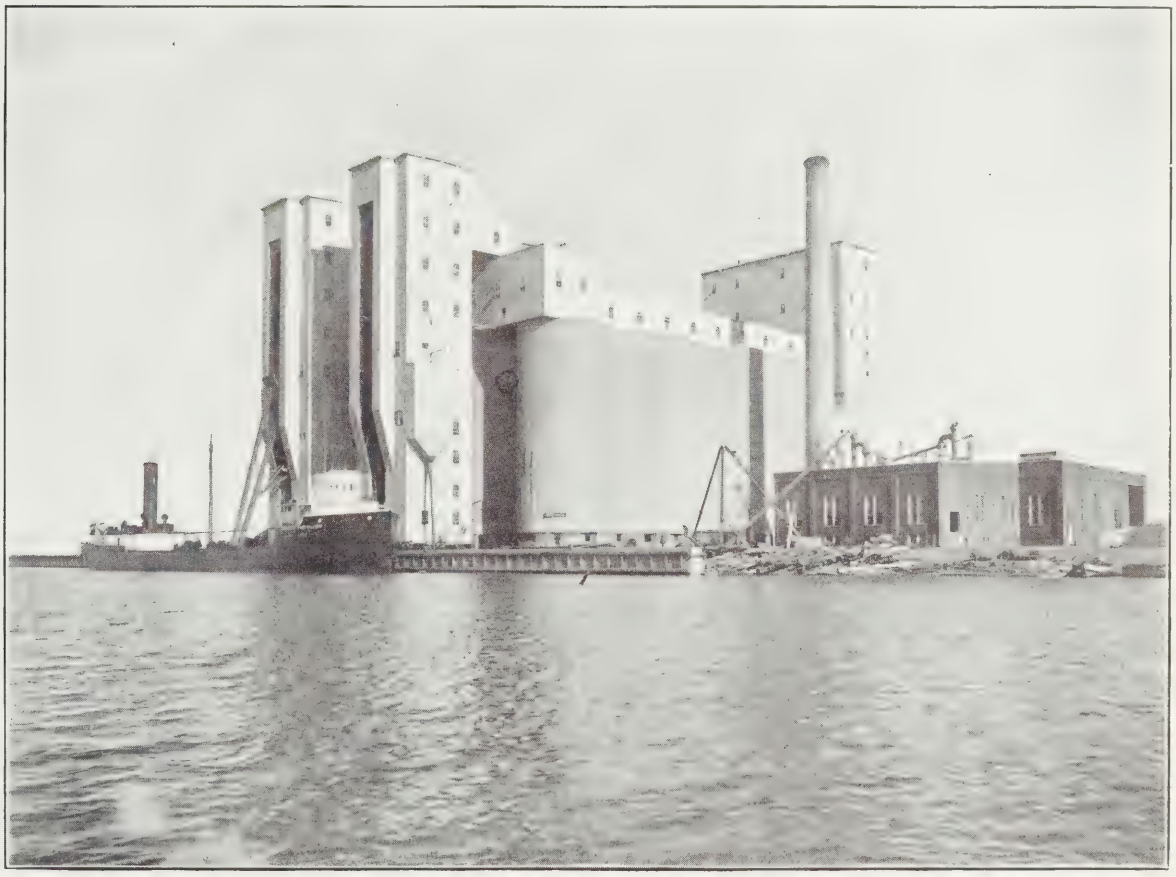
Gatineau Valley.

The Kipawa branch diverges from Mattawa on the main line and runs to lakes Timiskaming and Kipawa, both summer resorts visited by tourists from all directions.

Kipawa Branch.

From North Bay, the line continues to Sudbury, 439 miles from Montreal where it diverges and runs north of lake Superior. The junction of the Soo line with the route north of lake Superior makes this place an important town. A junction with the main line from Toronto is also made here. Industries of various kinds have been established and the district is known for its mineral deposits, particularly nickel. At Copper Cliff not far from Sudbury large nickel smelting works have been established which export thousands of tons of nickel and copper. The nickel deposit in this region is the largest known in the world.

Sudbury.



Canadian Pacific Railway Co.—New wharf and grain elevator, Port McNicoll, Ont.

From Sudbury, the line continues along the south of lake Superior to Sault Ste. Marie, 618.5 miles from Montreal.

Sault Ste. Marie. At Sault Ste. Marie is seen one of the greatest engineering feats of the continent. Here is the greatest lock in the world. The Canadian Government lock is nine hundred feet long and sixty feet wide. It was built in 1888–1895 at a cost of $4,000,000. The tonnage passing the Canadian and American locks at this point amounts to about 75,000,000 tons per year.

Sault Ste. Marie has been an important shipping centre for years. Here in 1797 was built the first lock on the American continent. This lock was afterwards burned in the war of 1812. The city itself is rapidly growing. It is situated on the St. Mary's river at a point where the flow from lake Superior is obstructed by tossing and tumbling rapids, and it is steadily gaining in importance as an industrial and commercial centre.

Sault Ste. Marie now has a population of about 16,000. The surrounding country is rich in iron, copper, nickel, and gold-bearing quartz, which is now being mined at a great profit. Millions of acres of timber are within easy reach of the "Soo" and have their only port here. The climate at the "Soo" is most delightful. The weather is steady in winter, but not enough to menace the commercial welfare of the city. Of much interest to visitors are the great industries of the lake Superior Corporation, including the bessemer steel plant and rolling mills, blast furnaces, pulp mill, sulphite mill. The Algoma Iron Works, car shops, veneer mill, charcoal plant, power plant, reduction works, and saw mills.

Canadian Pacific Ry. Co.—Freight yards at Fort William.

Canadian Pacific Railway Company—Grain elevator at Fort William, Ont.

For one in search of romance, or of scenic beauty, no place affords greater opportunity than Sault Ste. Marie, Ontario, for a few hours sail on the St. Mary's river or a short trip on the Canadian Pacific Railway will take him to scenes of unusual interest.

From Sault Ste. Marie connections are made with the Sault Ste. Marie South Shore line to Duluth and from Duluth to Winnipeg.

From Sudbury, the line proceeds along the north shore of lake Superior to Port Arthur and Fort William.

Port Arthur and Fort William. Fort William and Port Arthur at the head of the lakes are cities that are fast becoming extensive municipalities. Here are situated numerous big grain elevators where the wheat from the West is stored before being shipped further East. Here up till the middle of December the big freight boats can be seen at the docks taking on board their cargo for the lower lakes. In 1909 at Fort William, the general freight handled was 1,300,000 tons, coal, 1,200,000 tons. The vessels coming and departing numbered 2,002, tonnage 3,569,000.

From the head of the lakes the scenery along the Canadian Pacific Railway takes on a different aspect. Near Kenora the Lake of the Woods with its thousands of islands is passed and then Winnipeg is reached. It is essentially a new city but it is such a lively progressive municipality that strangers are impressed with its busy streets.

Winnipeg. Winnipeg 1,414 miles from Montreal is the capital of Manitoba, and the largest city in Canada west of lake Superior. It is about midway between the Atlantic and Pacific oceans. In 1870 its population was 215; in 1874 it was 1,869; in 1902, 48,411; in 1911, 175,000, and steadily

C. P. Ry. Co.—Station at Port Arthur—The black line on the horizon is the breakwater.

Canadian Pacific Railway Company—Kakabeka Falls, near Fort William, Ont.

increasing. Winnipeg is naturally a centre for the wholesale and jobbing trade of the great West and every branch of business is represented.

There are extensive stockyards, and immense abattoirs arranged for slaughtering and chilling meat for shipment to Europe and other markets. There is ample cold storage in the city for dairy produce, etc. It is an important railway centre, from which both east and west may be reached. Branch lines run to nearly every part of the province and a branch of the Canadian Pacific connects with the Soo line at Emerson, thus affording a direct route to St. Paul, Minneapolis, and Chicago. The yards of the Canadian Pacific Railway at Winnipeg are the largest in the world operated by one company, and contain one hundred and twenty miles of track. Winnipeg is the political as well as the commercial centre of Western Canada. The Legislative and Departmental buildings of the Manitoba Government and the chief immigration lands and timber offices of the Dominion Government for the West are located here.

Winnipeg is the eastern gateway to the prairies. From here for a thousand miles the train speeds through the wheat and ranch lands of Manitoba, Saskatchewan and Alberta. Extensive wheatfields are seen stretching away on all sides as far as the eye can reach, and new towns just recently out of their swaddling clothes. You see farms that have been yielding their crops for years, and farms that have only just felt the steel of the plough. All along the prairies are seen the old buffalo trails where the millions of buffalo which at one time roamed this part of the North American continent were wont to travel. New branches of

Canadian Pacific Railway Company—Passenger yards and station, Fort William, Ont.

Canadian Pacific Railway Company—Building irrigation dam, Bassano, Alta.

the railway reach out in all directions opening up new districts to the farmer.

Calgary.

At Calgary, 2,251 miles from Montreal, the line passes through the largest irrigation project of the North continent. At Bassano, near Calgary, there is being built across the Bassano river, in connection with this irrigation system the largest dam in Canada.

Shortly after Calgary is passed the range of the Rockies is entered. Behind are left the prairies, the wheatfields, and the cattle ranges, a plunge through the "Gap" the entrance to the Canadian Rockies, and there the traveller is in a world different from the one through which he has just passed. The approach to the mountains from Calgary is wonderful. Perhaps from Calgary the mountains have seemed quite near, but, when with a suddenness that is almost startling, the massive mountain side swings into view.

Banff.

In the midst of this grandeur of scenery is situated Banff the beautiful, with its sanitarium, hot medicinal baths, its Bow river for boating in the clear glacier water, its mountain drives thousands of feet high on smooth roads graded by the best government engineers, and its big C.P.R. hotel overlooking Bow falls. Here at the golf links congregate tourists from all over the world and here rest the brain fagged from everywhere, while the pleasure seeker finds all he needs for his quest. There is only one Banff.

From Banff to Laggan the mountain scenery loses nothing of its hold upon the traveller; the time seems only too short amid the wonders of the road. Laggan with its wonderful "Lakes in the Clouds" must be seen to be appreciated,

Canadian Pacific Ry. Co.—Lake Louise, Canadian Rockies.

Canadian Pacific Ry. Co.—Cement works at Exshaw, Alberta.

Canadian Pacific Ry. Co., Glacier, B.C.—The Great Glacier and Glacier House.

Canadian Pacific Railway hotel system—Banff, Alta.

Canadian Pacific Ry. Co.—Twin Falls; Yoho Valley, B.C.

"They are different" said a globe trotter meaningly.

At Field there is more glorious scenery. The place itself is a prosperous little village, but it is dwarfed into insignificance by the huge Mount Stephen, one of the grandest peaks in the whole Canadian Rockies. From Field there are many beautiful drives, one especially interesting being that to the Emerald lake around the Spurs of Mount Burgess. From here too, is reached the Yoho valley with its glaciers, its cascades, its snowcapped peaks and its wonderful Takakkaw falls—the highest caratact in America. Tourists from all parts of the world have pronounced this valley to be the most beautiful that they have ever seen.

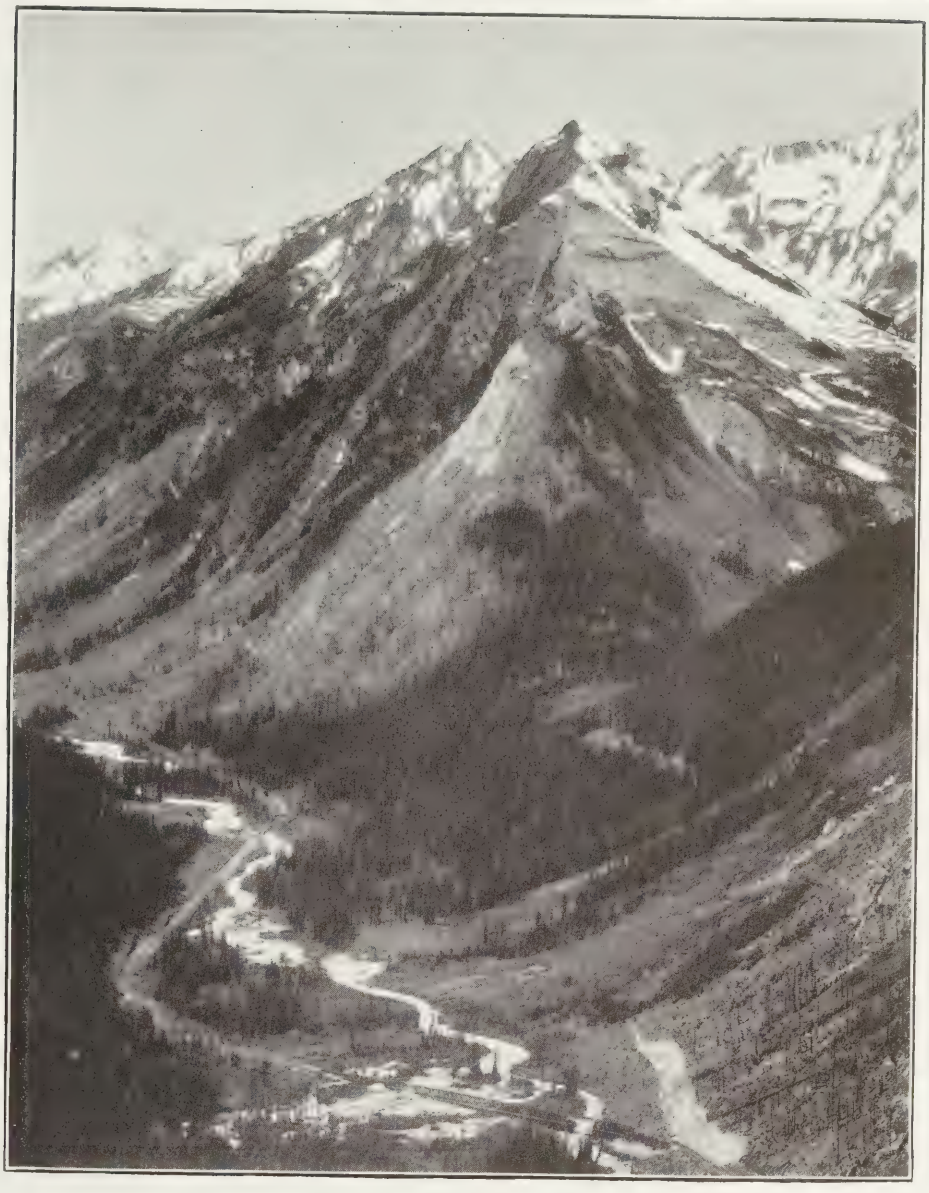
Field.

And Glacier, where in a narrow valley a beautiful hotel stands on a ledge carved out of the mountain side, is a place never to be forgotten. From the hotel one can easily walk to the glacier of

Glacier.

Can. Pac. Ry. Co.—Fraser canyon—View taken from inside a tunnel.

Canadian Pacific Railway hotel system—Chateau Lake Louise, in the heart of the Canadian rockies.



Canadian Pacific Ry. Co.—Illecillewaet Valley, B.C.

the Selkirks, the tongue of ice hundreds of feet thick lying in the valley just a few hundred yards above the hotel. Great caves, of recent exploration, are within easy distance by pony, and Swiss guides are at hand to aid the traveller who desires to try mountain climbing. The mountain scenery reaches its climax at Rogers Pass. Men who have seen the best mountain scenery of the Alps and of all famous parts of the world declare Roger's Pass is the finest of them all. Sublime beyond description is that point where the line is at its highest on the trip over the mountains. From here the drop towards the Pacific begins and spiral tunnels that wind carefully down, passing within a few hundred feet of points passed before, are features of the descent.

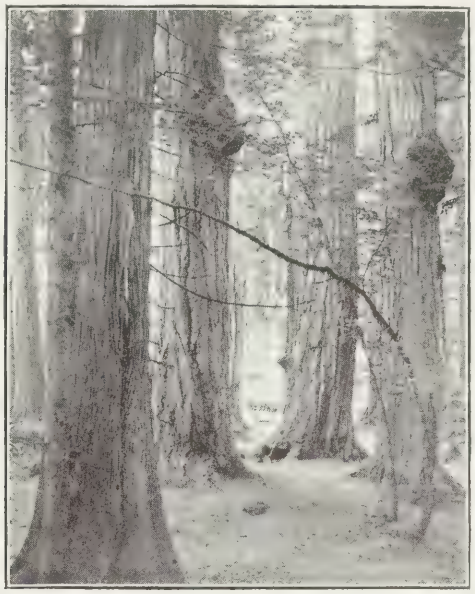
At Glacier there is the great Illecillewaet glacier a moving icefield, miles in extent. Here also are the caves of Sakimu with their wonderful sparkling caverns. Eastward near Golden is the model Alpine village of "Edilweiss" built

by the Canadian Pacific Railway for the accomodation of its Swiss Guides.

At Mission Junction a branch line of the C.P. R. runs to the International boundary to make connection with the Northern Pacific Railway for Seattle. The main line, however, travels to Vancouver.

Vancouver. Vancouver, 2,897 miles from Montreal, on Burrard Inlet, is the largest city in British Columbia, and has one of the finest harbours on the Pacific. From the standpoint of location it is unsurpassed, from the standpoint of progressiveness, unique. It typifies the true progressive spirit of the West. Where twenty-five years ago Vancouver was nothing but a name, today it is a hustling city of 120,000—and still growing. With its great harbour facilities it is building up an universal shipping trade. In fact the progress made by this port along shipping lines is nothing short of wonderful. Today there is a regular steamship service to Victoria, Nanaimo and San Francisco, to China and Japan, to Australia and New Zealand via Honululu, H.I., Suva, Fiji, and to Puget Sound and Alaskan ports, while it is the terminus of the ocean lines trading between London and Canada via China and Japan. It is one of the principal points of departure on the coast for the Yukon and other northern goldfields, and an outfitting headquarters for miner and prospectors. The Canadian Pacific Railway's White Empress Line steamships take the shortest route to Yokohama, Kobe, Nagaski, Shanghai and Hong Kong, making the quickest passage by from five to ten days across the North Pacific,

Canadian Pacific Railway Company—The Loops near Glacier.



Candian Pac. Ry. Co.—Some big trees in Stanley Park, Vancouver.

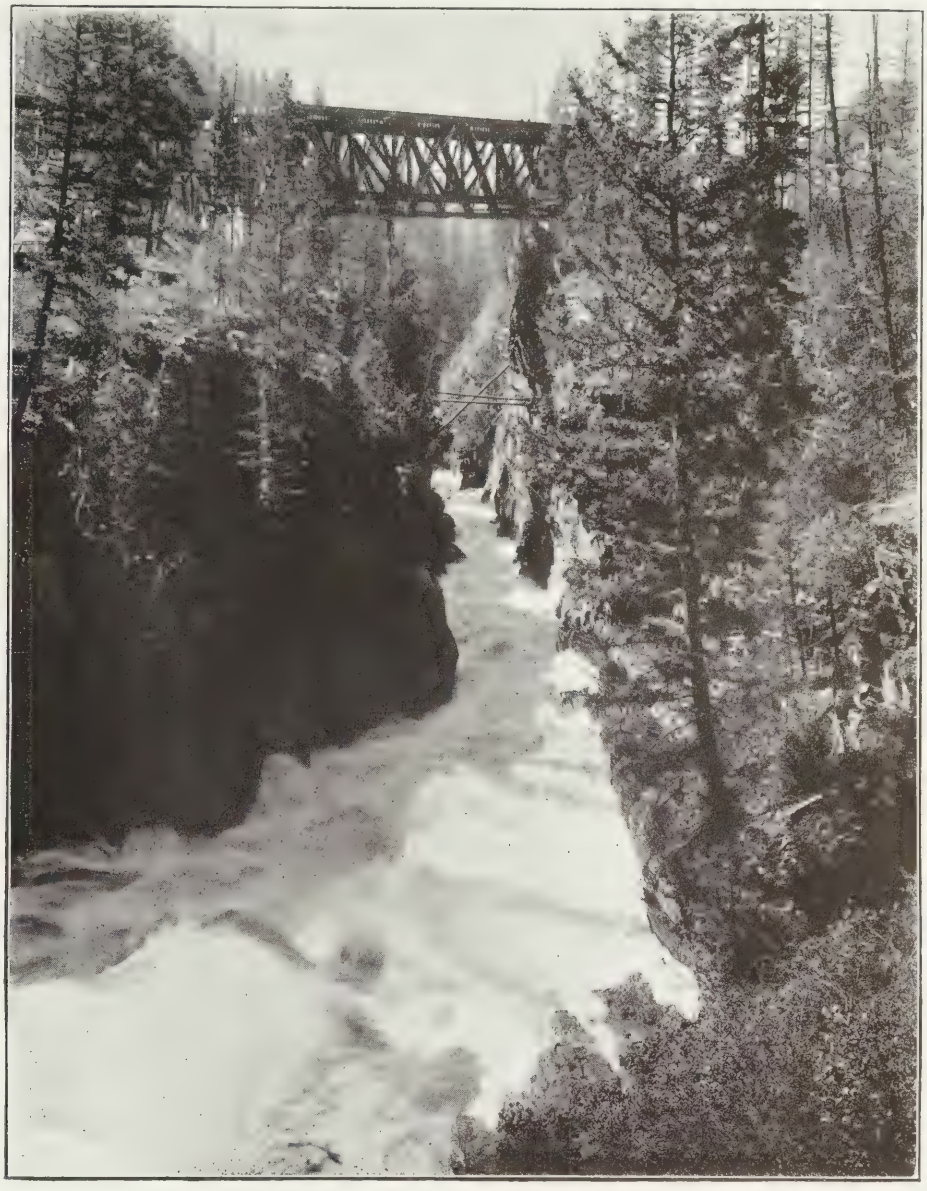
Canadian Pacific Railway Company hotel system—Hotel at Vancouver.

Canadian Pacific Ry. Co. hotel system—Hotel Empress, Victoria, B.C.

departing every two or three weeks. Steamships of the Canadian Australian line sail from Vancouver every four weeks for Sydney, Australia, via Honululu, Suva and Brisbane. The shipping returns at Vancouver for 1909–1910 were given as, 16,169 vessels of 6,456,838 tons register.

Victoria across the strait from Vancouver has been aptly described as a transplanted section of old England. It is a beautiful residential city, with many miles of magnificent roads and parks and government buildings which rank among the handsomest in America. Like Vancouver, Victoria has a big shipping trade. Its outer wharfs have thirty feet of water at low tide. Steamboats afford connections with Vancouver and British Columbia mainland, and with Puget Sound ports, and steamships depart every five days for San Francisco, connecting there for Southern California, Mexico and South American west coast points. Steamers from and to Vancouver for Japan, the Hawaiian and Fijian islands, and Australia, stop at Victoria, many tourists taking the steamer at this port, and there are regular sailings for Alaskan points both for tourists visiting the wonderful fiords of the north coast, and those intending to explore the great gold belt of the Yukon. Esquimalt Harbour, two miles from Victoria, was formerly the British naval station and rendezvous on the North Pacific, with naval storehouses, workshops, graving docks, etc.

The trip up the coast to Alaska is becoming more and more popular each year. There is a regular line of steamships on this route and it is undeniably one of the most novel and interesting trips in the world. Skagway is the most northern point touched.



Canadian Pacific Railway Company—Goat River Falls, near Erickson, B.C.

Crows Nest Pass Line.

Diverging from the main line of the Canadian Pacific at Dunmore, an attractive alternate route is offered to the Pacific Coast via the Crow's Nest Branch, through the great ranching districts of Southern Alberta and the vast mining regions of the Kootenay, thence by way of Nelson, the Columbia river and Arrow lakes to Revelstoke, where the main line is joined for the trip to Vancouver.

On the Columbia river, and the Arrow, Slocan and Kootenay lakes the steamship service is operated by the Canadian Pacific Railway. The steamers are speedy and well equipped and besides the passenger traffic, carry a big freight business. The steamship "Bonnington" the first steel steamship on these lakes was recently launched by the Canadian Pacific Railway. Travelling one way via the Canadian Rockies, the trip through the Kootenay in the reverse direction makes a particularly attractive and enjoyable tour.

TUNNEL THROUGH THE ROCKY MOUNTAIN RANGE.

Of the many engineering difficulties encountered by the builders of the Canadian Pacific Railway in laying the steel rails through the Rocky Mountains, none presented such serious problems as those involved in the overcoming of the grade of the "Big Hill," just east of Field, B.C. All the way through the mountains during the building of the road, the engineers were being continually called upon to solve fresh engineering problems in railway construction. None of these, however, were of the magnitude of these presented at Field. Here after the road had been finished and operated for some years it was decided that something had to be done to overcome the difficulty of operating over the "Big Hill." As first completed the grade of the railway at this point was a 4.5 one. Four engines were necessary to haul one train and even then a speed of but four or five miles was all that was possible. Not only was the expense of operating very heavy, but there was a certain element of danger, to be reckoned with.

When it was decided to reduce the grade many plans were submitted and the problem was one that occupied the attention of a great part of the engineering world. Finally it was decided to overcome the grade by a series of spiral tunnels. Truly the work was a stupendous one, but once the decision to tunnel was arrived at, no time was lost in getting to work and after two years of great effort, the work was finished at a cost of $1,270,000 and the C.P.R. travelled over a new route between Hector and Field.

Canadian Pacific Ry. Co.—The Loop and Spiral tunnels near Field, Canadian Rockies.

Canadian Pacific Ry. Co.—The Lethbridge Viaduct, 1 mile 47 feet long, 307 feet high.

Taken altogether the Hector-Field reduction is a wonderful piece of engineering. Not only is it the greatest piece of tunnelling ever attempted in Canada but it is the first introduction of this spiral system of tunnels, on this continent.

Entirely opposed to the old line as constructed with its incline of 237 feet to the mile and its curves of 11.5 degrees, the new line zigzags down the side of Mount Stephen in loops instead of taking a single plunge, and disappears in a spiral tunnel in the depths of which it turns completely round. Emerging forty eight feet below the entrance, it retraces its course at a lower level to another spiral tunnel, in which it again turns almost a complete circle, and it then doubles back on its original course at a still lower level to rejoin at last the old line below its steepest grades. The whole thing is a perfect maze, the railway doubling back on itself twice, tunnelling under mountains and crossing the river twice.

Put in brief the work which has been completed is as follows:—Length of two tunnels, $1\frac{1}{4}$ mile, length of cutting outside of tunnels, 7 miles, increase in length of track, $4\frac{1}{4}$ miles, reduction in grade, from 4.5 to 2.2, number of men employed, about 1,000, with complete outfit of steam equipment. 75 carloads of dynamite were used, or upwards of 1,500,000 pounds of the explosive. The cost of the explosives alone came to over $250,000.

During the tunnel work for the first time in Canada, steam shovels were operated by compressed air. One of these machines was installed at the working head in each tunnel, the cutting being worked from opposite ends. Despite the complicated work caused by the shape of the tunnels they met exactly, the work being completed with marvellous exactness.

The result of the whole operations is that the cost of operations has been cut to about one-third of the former cost, two engines now haul the trains formerly needing four engines, while the element of danger inseparable from high grades has been practically eliminated.

Many important bridge structures have been built by the Canadian Pacific Railway in linking the two oceans with its transcontinental line. Probably the most important of these structures is that at Lethbridge where the railway has erected, what is, taking everything into consideration, the largest railway viaduct in the world. Here the railway in its early days was carried across the Belly River and the Old Man River by a series of twenty wooden trestles, or bridges. Since then these twenty bridges have been replaced by two immense steel viaducts, one, 5,327.6 feet in length, with a maximum height of 314 feet above the water and the other 1,900 feet in length with a height of 146 feet above the water. Both these viaducts are immense structures and were built at a great cost, the outlay being over $2,000,000. 645 cars of steel and over two thousand car loads of materials were used in the construction of the viaducts.

Lethbridge Viaduct.

Another big C.P.R. bridge is that crossing the St. Lawrence river at Lachine, near Montreal. When it was first built this structure was one of the longest cantilever bridges in existence. It is nearly three quarters of a mile in length and as the river at this point flows at a remarkably swift rate, it was at the time of building considered a remarkable feat of bridge engineering. An interesting feature of this bridge is that while it has only been used since 1886, the traffic of the C.P.R. has increased so greatly since that year that it has been found necessary to double track the bridge, which work is now being pushed to completion. This work is attracting considerable attention inasmuch as it involves the replacing of the old structure with a new bridge, twice as wide, four times as heavy, carrying two tracks and resting on several additional piers, all without delaying traffic.

Lachine Bridge, Montreal.

A freight engine on C. P. Ry. Company.

Mallet compound locomotive used in the Canadian Rockies by C. P. Ry. Company.

Still another big C.P.R. bridge is that being built at Edmonton, over the Saskatchewan river, to join the city of Edmonton to the former town of Strathcona in a greater Edmonton. This bridge which will be finished this year is 2,800 feet long, has a height of 200 feet above water level and will cost approximately $1,500,000. Two other big bridges are being built by the C.P.R., at Outlook.

Edmonton-Strathcona bridge.

An interesting fact in connection with the Canadian Pacific Railway's fleet is, that its Pacific Coast service steamships, are being rapidly transformed into oil burners. The installation on these boats is very simple, the oil being forced into the furnaces through a specially constructed nozzle, in a conical spray, when it at once becomes ignited. Among the advantages of burning liquid fuel it may be mentioned that firemen may be dispensed with, there is no handling of ashes, and no coal dust or dirt in the stokehold. Furthermore all the discomfort of coaling a ship is obviated.

Oil Burning Steamships.

An unique feature of the Canadian Pacific is that it builds all its own rolling stock. It has big shops at Montreal and Winnipeg and is at present building new shops at Calgary, Alberta.

Railway Equipment.

Its Angus shops at Montreal, employ over six thousand men and form one of the biggest plants in American being equipped to turn out an entire new train every working day in the year. This is one reason why the railway is famed all over the world for the magnificence of its rolling stock. No other railway on the continent operates such truly magnificent passenger traffic equipment. One of the finest type of cars operated by the C.P.R. is the Library-buffet-observation car. This car was especially designed by the C.P.R. for use on its transcontinental trains and it is one of the handsomest and most comfortable cars in use in America. The observation room is well supplied with the books of standard authors and popular magazines. A very ingenious arrangement in connection with the chairs permits of the attaching of a very neat little table for cards or afternoon tea. The observation platform is wide and is always a popular point from which to get an unobstructed view of the passing scenery.

The Compartment—observation,—sleeping cars operated by this Company are also high class equipment. Each car contains seven compartments, a drawing room, an observation parlor and an observation platform. Each compartment contains upper and lower berths and all toilet requisites. The cars are lighted by electricity and are provided with electric fans for use in hot weather.

No expense has been spared to make the sleeping and parlor cars operated by the company as high class as the rest of their equipment. They are finished outside in polished mahogany and their interiors, with their beautiful fittings, are beyond comparison. The berths are higher, wider and longer than in ordinary sleeping cars, and the curtains, blankets and linen are made expressly for the company. Writing paper and envelopes are furnished free to passengers and a daily bulletin keeps travellers informed of the events of the world. Sleeping cars are provided with electric bells and all other conveniences. The first class passenger cars are large and most substantially built. They are well lighted and well ventilated. The seats are all upholstered and are most comfortable.

The dining car service of the company is the best in the country. A great part of the produce used is grown on the C.P.R's own model farms.

Canadian Pacific Railway Company—Standard Passenger Train.

The cars themselves are big, airy and conspiciously clean, and each car is in charge of a competent conductor whose duty it is to see that patrons receive every possible courtesy.

There are many other types of cars built by the C.P.R., but they differ only in small details from the cars described above. The workmanship on all cars is of the highest standard and the interior fittings and furnishings are of the most up-to-date nature.

Large Railway Yards.

At practically every point on its transcontinental and branch lines the C.P.R. has sidings and yards of considerable size. At Winnipeg it has the largest railway yards in the world, having at this point over 120 miles of track.

Port McNicoll Terminal.

The Canadian Pacific Railway's new terminal at Port McNicoll, on Georgian Bay, is destined to become one of the most important points of the Great Lakes. Not only will it take an important part in the grain traffic from western Canada, but the terminal gains importance from the fact that it is now the eastern headquarters for the C.P.R.'s fleet of Great Lakes steamships. Much money was spent by the C.P.R. in completing the terminal, the work involved being particularly heavy. The operations included the building of several miles of concrete wharves and the dredging of channels to accommodate the big freight and passenger steamships, the building of a huge new elevator, the erection of several big 1,000 foot storehouses, and the building of numerous smaller structures, including a power plant, cot-

Canadian Pacific Railway Company—Part of the freight yards, Winnipeg, Man.

tages and boarding houses for employees, etc. Probably the most interesting feature of the plant is the new elevator. It at present has accomodation for 3,000,000 bushels of grain, but it is so built that in the future it can be extended to accomodate 10,000,000 bushels of grain. All of the machinery in the plant is of the very latest design and the structure is the most up-to-date in Canada. A system of 750 incandescent lamps and twelve arc lamps makes the operation of the plant as easy by night as by day. Telephones, electric bells, and signal lamps, dust collectors, etc., have been installed and the whole plant is entirely fireproof.

C. P. R.—ROUND TRIP FARES.

	From Chicago.	From Toronto.	From Fort William.	From Duluth.
	$ cts	$ ct .	$ cts.	$ cts.
Winnipeg—rail	40 10	55 00	21 00	21 50
Winnipeg—lake and rail	.....	60 00	.....	.....
Banff	66 00	81 10	50 00	50 00
Edmonton	68 60	81 10	60 00	.....
North Pacific Coast (Summer Tourist)	72 50	87 60	60 00	60 00
North Pacific Coast (Convention, certain dates only)	65 00	77 10	55 00	55 00
San Francisco, Cal., direct	72 50	87 60	.....	.....
San Francisco (one way via Portland, Ore.)	87 50	102 60	.....	.....

From Duluth, Minn., to and return to	Vancouver, B.C. Victoria, B.C. Seattle, Wash. Tacoma, Wash. Portland, Ore.		San Francisco, Cal., One Way via Portland, Ore.	
	Summer Tourist.	Convention.	Summer Tourist.	Convention.
	$ cts.	$ cts.	$ cts.	$ cts.
Duluth, Minn	60 00	55 00	71 00	.....
St. Paul, Minn	60 00	55 00	.....	.....
Port Arthur, Ont	60 00	55 00	.....	.....
Chicago, Ill	66 25	61 25	81 25	76 25
Toronto, Ont	74 30	69 30	89 30	84 30
Montreal	78 00	73 00	99 25	94 25
New York	86 25	81 25	101 25	96 25

Passengers from Duluth have the option of travelling via Soo Line to Emerson or Portal, thence Canadian Pacific Ry. to Vancouver, B.C., main line through Calgary or via Crows Nest branch through Lethbridge, Nelson and Arrowhead, and to Seattle via Vancouver and steamer or via Mission Junc. Sumas and rail; to Portland via above routes to Seattle thence rail, and to San Francisco via regular routes to Portland thence rail or steamer. San Francisco tickets will be good only returning via direct U.S. lines (not via Portland, Ore.)

SLEEPING CAR BERTHS (LOWER)—EACH WAY.

	Winnipeg.	Banff.	Edmonton.	Vancouver.
	$ cts.	$ cts.	$ cts.	$ cts.
Fort William	7 50	13 00	12 25	16 00
	2 50	8 25	8 25	12 50
Chicago	2 50	8 25	8 25	12 50
	4 50	9 00	9 25	13 00

Upper berths 80% of lower berth fares.

APPROXIMATE TIME IN DAYS EACH WAY (24 HOURS TO THE DAY).

	Winnipeg.	Banff.	Edmonton.	Vancouver.
Toronto—by rail	½	3	3½	4
Fort William	½	2	2	3
Duluth	½	2	2½	3

From Toronto by lake ½ day longer.

CANADIAN PACIFIC—SIDE TRIPS.

FROM TORONTO, ONT. TO			FARE.
All round Muskoka Lakes, via Bala, Ont			$7 55
Bala and return	"		4 55
Beaumaris "	"		5 25
Bobcaygeon and return	"		4 25
Bisco "	"		14 80
Burleigh Falls "	"		4 60
Byng Inlet "	"		7 60
Dayton "	"		16 40
Desbarats "	"		17 90
Goderich "	"		6 50
Kipawa, Que. "			12 90
Lindsay, Ont. "			3 45
Missanabie, Ont. "			22 00
Montreal, Que. "	(all rail)		16 70
" "	(optional rail or steamer)		17 60

FROM TORONTO, ONT., TO			FARE
Nipigon, Ont.	"		34 65
Ottawa, Ont.	"		12 85
Owen Sound, Ont., and ret	rn		6 10
Parry Sound, Ont.	"		6 00
Peterboro, Ont.	"		3 85
Pointe au Baril, Ont.	"	(Hotels)	8 60
Port Carling, Ont.	"	(Hotels)	5 85
Port Cockburn, Ont.	"		6 15
Rosseau Ont.	"		6 35
Royal Muskoka, Ont.	"		5 85
Sudbury, Ont.	"		10 30
Temiskaming, Que.	"		12 55

PARTY FARES.

For parties of ten (10) or more travelling together on going journey at rate of one first class, one way fare and one third will be made for the round trip between stations in Canada. Passengers may return individually within the final limit of tickets which is thirty days from date of issue.

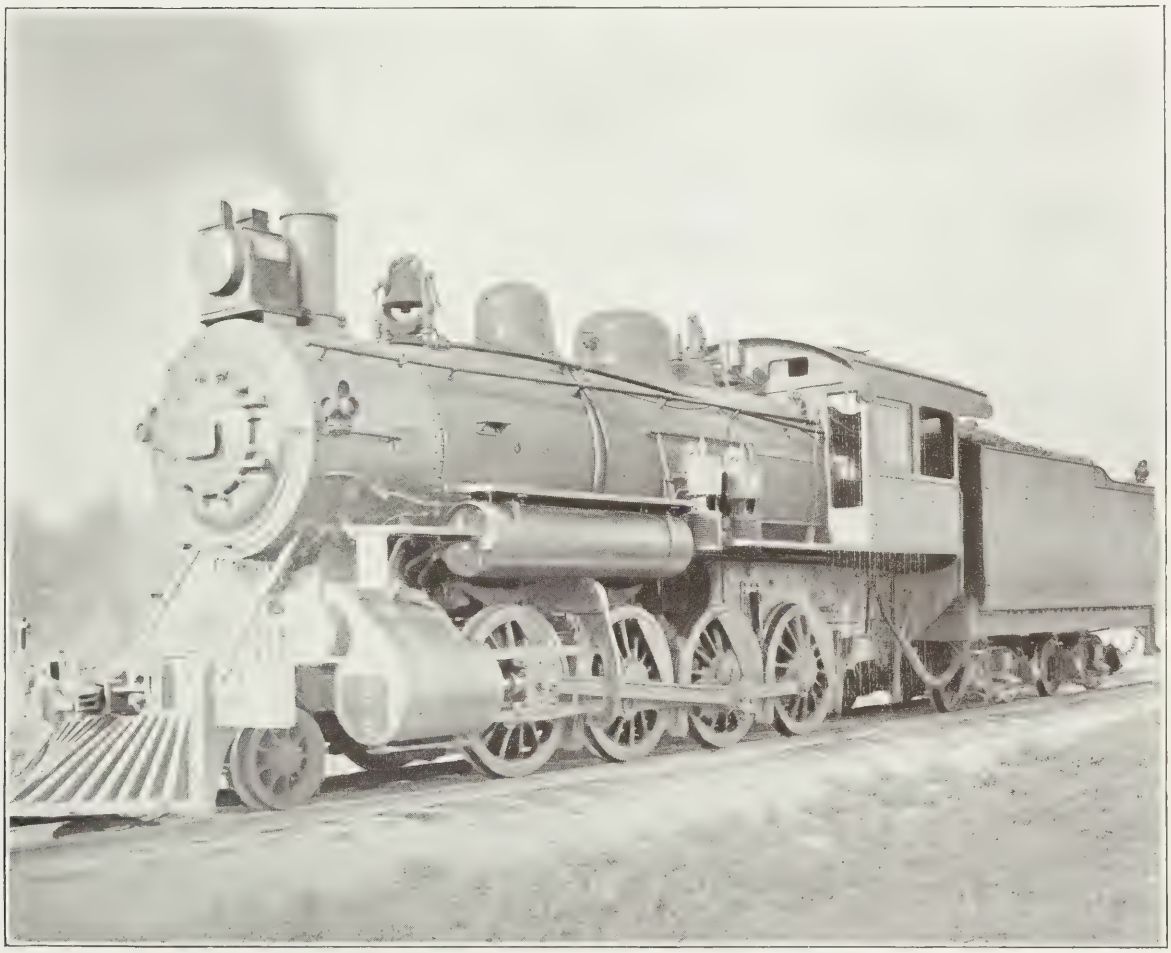
CANADIAN NORTHERN TRANSCONTINENTAL RAILWAY.

Not the least interesting feature in connection with the Canadian Northern Railways is the opening up of new resorts and holiday grounds to the people of the world.

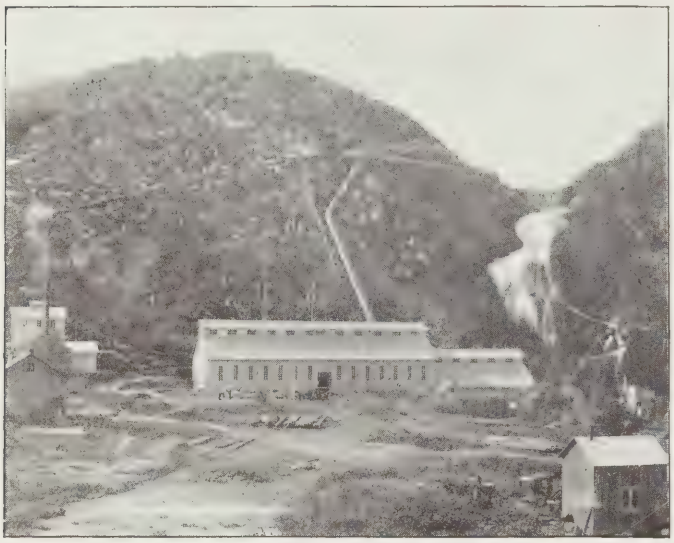
For instance, the Rainy Lake District, one of the most charming fishing, and hunting grounds of Canada, was, previous to the advent of the Canadian Northern Railway, accessible only by a long and tedious water trip—now one can step off palatial Canadian Northern sleepers, into the midst of this most delightful region. In Muskoka, new and unexpected vistas of lake and island scenery have become easily accessible by parlor car from Toronto, and within a few months the same easy means of communication will be pro-

Canadian Northern "Standard Passenger Trains" at North Battleford Station.

Canadian Northern Railway System—Shawinigan Falls, Quebec—Now developing over 100,000 electrical H. P.



Canadian Northern Railway—Standard freight engine.



Canadian Northern Railway—Ouitchowan Falls, Lake St. John District, Quebec—280 feet, 10,000 H. P.

Canadian Northern Ry. System—C. N. R. Prince Edward hotel, Brandon, Man.

vided into the heart of the Rideau lakes. In Nova Scotia, the Canadian Northern skirts the Atlantic coast where sea bathing, deep-sea fishing, yachting, and kindred amusements can be enjoyed after alighting from the train within a short distance of the summer hotel. In British Columbia, where the line is now already under construction, attention will be given to the needs of the tourist and holiday-maker. "All work and no play makes Jack a dull boy" is a well known axiom and the Canadian Northern while making the most ample provision for industries and other business propositions, made available by the opening of the new railway, is, at the same time, not losing sight of the fact, that the people of Canada are on the continual look-out

Canadian Northern Railway System, Quebec Along the picturesque Batiscan river.

for places of rest and recreation, which can be reached without difficulty. The locating engineers keep this fact well before them, and include as many scenic and resort features in their survey, as may be consistent with easy grades, a minimum of curvature and the reaching of all important places in the general direction of the line.

The result is, that Halifax and Yarmouth have become central points of connection for Atlantic shore resorts. Quebec is the gateway to the wonderful Chicoutimi country, where fish and game abound. Ottawa and Montreal will be headquarters for Ottawa river and Rideau lakes resorts, Toronto the starting point for the Muskoka region, and Fort Francis for the Rainy lakes. British Columbia, including Vancouver Island, will produce some of the finest and most picturesque points in the world, which will be brought within easy reach when the Canadian Northern Railway becomes an uninterrupted transcontinental line.

Canada's third transcontinental— the Canadian Northern is a difficult road to keep familiar with as far as construction is corncened. Thousands of men busy with its building have laid down new lines in different parts of the country with such rapidity that the maps of the system are continually changing.

According to the last annual report of the Canadian Northern Railway proper, which consists of that section lying between Port

Canadian Northern Railway—Kakabeka falls.

Canadian Northern Railway—Coal docks at Port Arthur.

Canadian Northern Ry. Co.—The Atikokan Iron works at Port Arthur, Ont.

C. N. Ry.—Northern Sask., Elevator Ave.

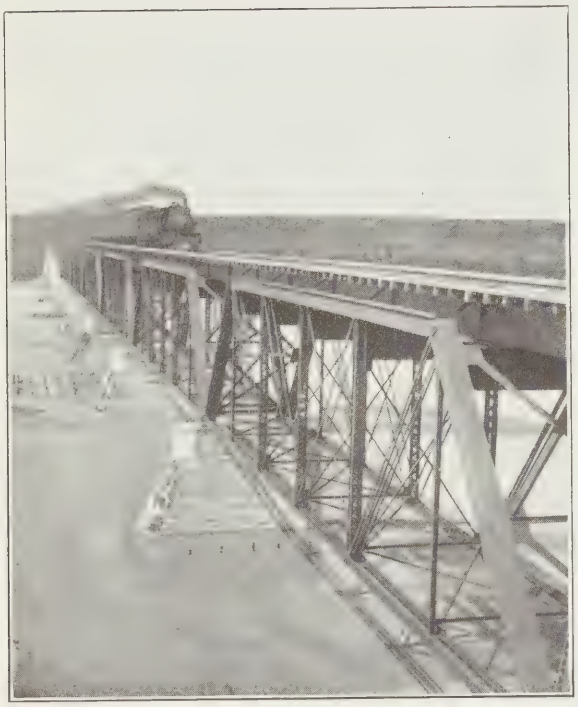
C. N. Ry.—Ranching in Saskatchewan.

Canadian Northern Ry. System—Woodpulp from the Lake St. Joseph district, Quebec—34 cars—Gross weight, exclusive of engine and van, 1,810 tons, January 19, 1911.

Can. Northern Ry.—A portion of a wheat train—The whole train consists of 30 cars, which made a photograph of the whole impossible.

Canadian Northern Railway—Stooking scene.

Canadian Northern Ry.—North branch of the Saskatchewan river, from Elbow bridge.

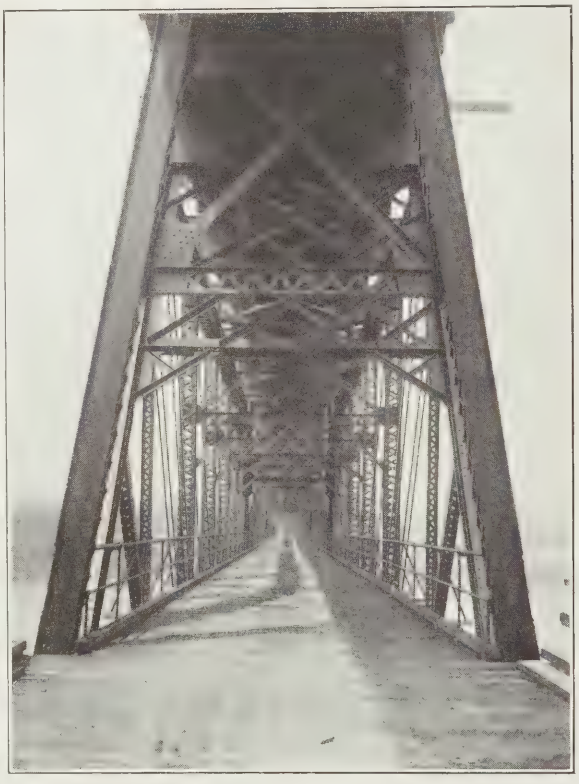


Canadian Northern Ry.—"Alberta Express" crossing the bridge at the Elbow, Saskatchewan river.

Arthur and Edmonton, the average mileage operated there during the fiscal year which ended on June 30th was 3,383 miles. Just lately, however, a new time-table was issued by the Company showing a total of 4,415 miles in operation on the prairies alone. This is an increase of slightly more than a thousand miles. It does not necessarily follow that all of this was built during 1911, but the figures go to show the wonderful force that is driving this transcontinental line through to completion.

In November, 1911, figures compiled at the head office of the Canadian Northern Railway Company showed a total of 1,633 miles under construction in Canada. Of this, Saskatchewan, Alberta, Manitoba, were allowed only 563 miles. That is the Canadian Northern proper. British Columbia and Ontario were included in this total of new line. In the case of the former, 500 miles are shown as in process of building while Ontario shows the largest percentage of all—570 miles. The Pacific coast division is that now being built between the Yellowhead pass and Port Mann, the Pacific terminal of the railway; the mileage in Ontario is made up of the section still to be completed on the Toronto-Ottawa line and that between Montreal, Ottawa and Port Arthur. The program for both of these provinces taken together and added to the existing lines gives a transcontinental line from tide water at Quebec to the Pacific coast.

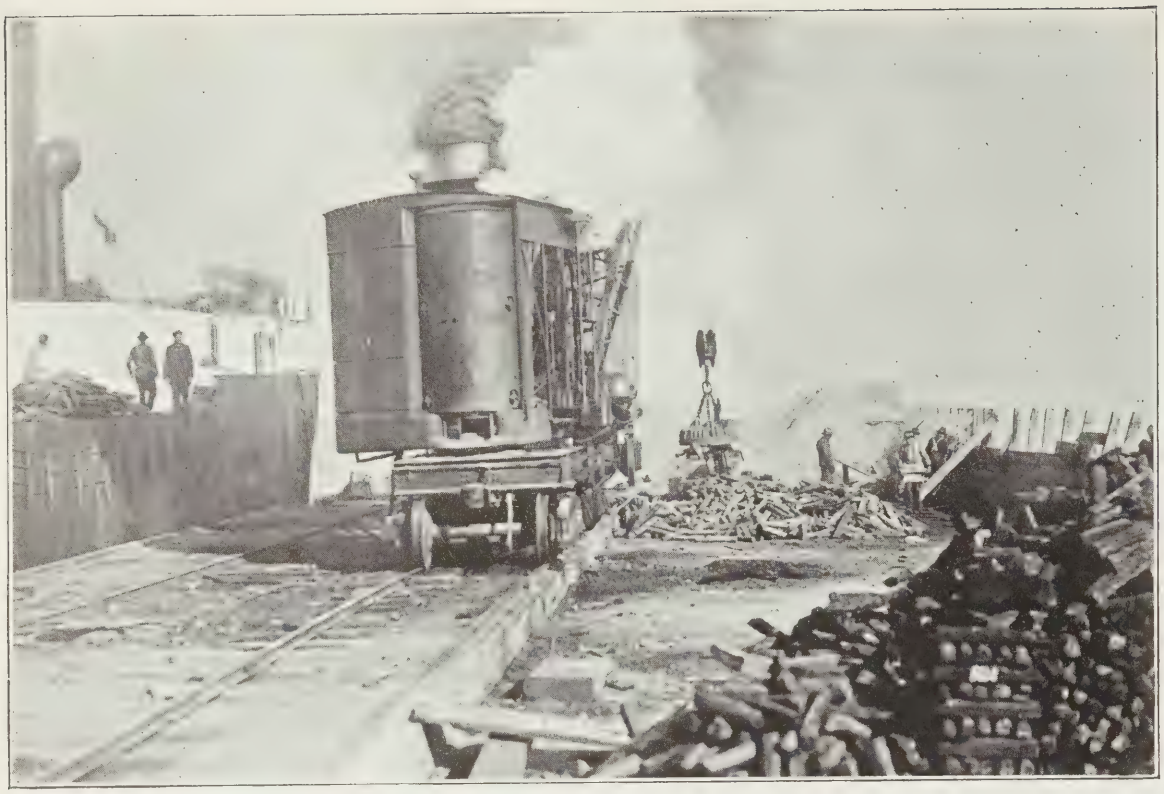
Of this total mileage, 1,633, approximately 700 miles, were completed during 1911. The balance has of course been carried over to 1912 including as it does those big links between Edmonton and the Coast and between the Eastern and Western lines in Ontario. This does not, however, comprise the entire building program for 1911, because there are many lines now contemplated the details of which have not yet been worked out. But there will be ample provision made for the development of new districts especially in the three prairie provinces.



Can. Northern Ry.—The public way—The railway is overhead—Fort Saskatchewan.

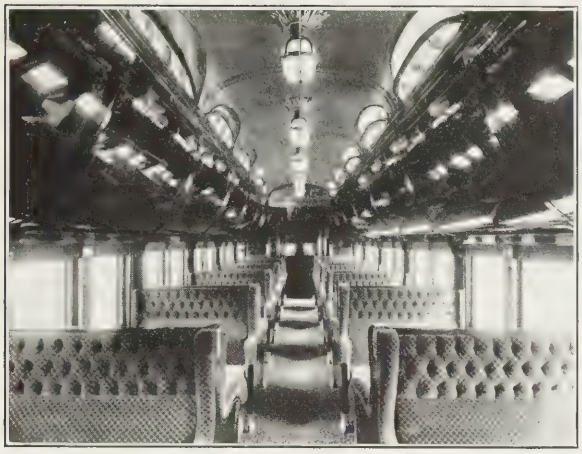
Canadian Northern Ry.—A big freighter loading at Port Arthur, Ont.

Canadian Northern Ry.—Elevator at Port Arthur Ont., the largest in the world.



Canadian Northern Railway—Lifting pig-iron by magnet.

C. N. Ry.—The Saskatchewan river near Radison, Sask.



C. N. Ry.—Interior of Sleeper.

C. N. Ry.—Moose, Rainy lake.

Canadian Northern Ry.—Interior of Dining car.

Much speculation has been indulged in as to the probable date when the Canadian Northern Railway's transcontinental line will be finished and in operation, across Canada. It is not of course an easy matter to estimate, but it is interesting to notice, that all of the work which can fairly be set down to the transcontinental idea is under contract to be completed by the end of 1913. In both British Columbia and Ontario, the building operations will be pressed with vigour all through this year and on both divisions there will be employed a total of about 9,000 men, almost equally divided between British Columbia and Ontario. The construction gangs will be employed in cutting the right of way, the getting in of supplies and in the blasting of the rock section. There are in British Columbia alone nearly two and a quarter miles of tunnels. Work on these is being pushed forward with the utmost despatch so that the track men and the graders will not be delayed when the operations open again next spring.

The Canadian Northern from Toronto to Ruel is 327.9 miles. This is as far as the Canadian Northern is completed for passenger traffic, but in going west, this line can only be used as far as Sudbury where one must take the Canadian Pacific Ry. to Port Arthur a distance of 552 miles. From Port Arthur to Winnipeg is a distance of 439 miles. From Winnipeg to Prince Albert is a distance of 565 miles, North Battleford 572 miles and to Edmonton, Alta. 826.9 miles.

Another line runs from Winnipeg to Prince Albert which passes Portage la Prairie, Dauphin, Kamsack, Humbolt, Warman and which connects with the main line at North Battleford. Another line runs south of the one just mentioned from Portage la Prairie, passes Carberry, Brandon, Maryfield, Regina, Saskatoon, and joins the northern line at Prince Albert, a distance of 549 miles from Portage la Prairie or 605 miles from Winnipeg.

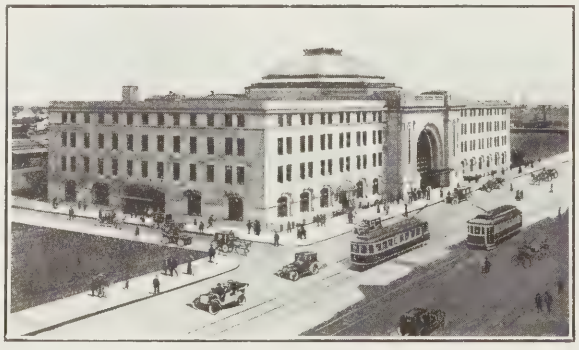
A branch from Neepawa to Canora a distance of 223.3 miles. A branch from Saskatoon to Calgary which is not yet wholly opened for traffic.

The Oak Point-Gypsumville section distance from Winnipeg to Gypsumville, Man., 158 miles.

From Toronto to Trenton 110.5 miles. From Trenton to Picton a distance of 30.53 miles is run on the Central Ontario Railway. From Trenton to Maynooth, 101.7.

From Ottawa to Montreal, 125.7 miles. From Montreal to Quebec 176.1 miles, passing Rawdon with its mountain scenery, Joliette, Shawinigan whose falls rivals those of Niagara in grandeur, Grand Mere noted for its water power and pulp and paper industries.

From Quebec to Chicoutimi a distance of 227 miles, passing lake St. Joseph, La Tuque, lake Edward and Roberval.



C. N. Ry.—Station at Winnipeg.

INTERCOLONIAL RAILWAY.

The Intercolonial Railway of Canada is in more senses than one the people's line. As a Government road it is owned by the people, and in operation of the line this principle is ever kept in view, so that the best available service will be given. In another sense it is the people's line, because it is popular as the great all Canadian system, and the only all rail line from Montreal to the extreme points of the Maritime provinces. It is equally popular as the great tourist and sportsman's route, and that by which the desirable places in the provinces by the sea can be most conveniently reached.

The Intercolonial railway, with the Prince Edward Island railway, embraces nearly 1,700 miles of thoroughly built road, with rail and steamer connections for many hundreds of miles in addition to this; and it traverses the most varied and inviting tourist country on the continent. Each year the advantages of this route are becoming better known and the volume of travel is increasing, until the country of the Intercolonial attracts tourists from every part of the civilized world.

Montreal. Starting from Montreal, the Intercolonial crosses the Victoria Jubilee bridge, passing through the beautiful country east of the Canadian metropolis, and takes the shortest and most direct route to Quebec, unique among the cities of the continent of North America, from its age and interesting historic associations. Everywhere are monuments of eventful history, places about which volumes have been written to tell only a small part of their romance. There is place after place in Quebec where one may step out of the bustle of to-day back into the seventeenth century. It is the old and the new—to-day being always side by side with the past. Quebec is most picturesquely situated on the base and summit of a lofty cliff, projecting into the St. Lawrence.

Quebec. From the citadel, which crowns the summit of the cliff, and from Dufferin terrace, the immense esplanade at the base of the citadel, a view of indescribable beauty is obtained. Trolley cars carry passengers to the various places of interest, such as Montmorency falls, which every visitor to Quebec should see, and to Ste. Anne de Beaupre, Canada's famous shrine, where thousands of afflicted persons journey every year. The large and handsome Redemptorist church, with its costly furnishings and beautiful paintings, contains pyramids of crutches near the entrance doors, as evidences of the miraculous cures that have been made. The summer climate of Quebec is cool and healthy and, with so many advantages, it is not to be wondered that the city is a Mecca for pleasure seekers. But Quebec is a great city commercially also, having a large and steadily growing trade.

Montmorency falls.

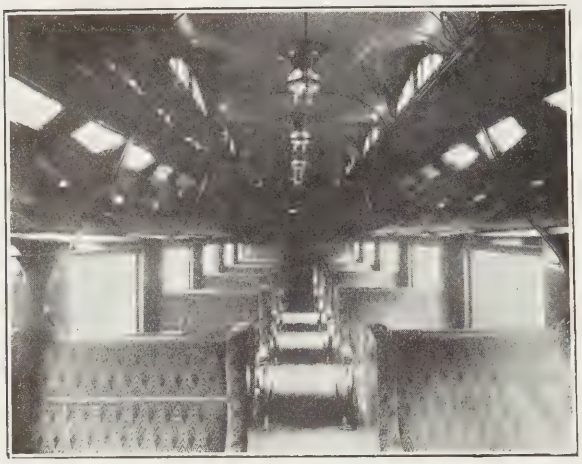
St. Anne de Beaupre.

Levis. Resuming the journey from Levis via the Intercolonial, the next two hundred miles of the route is through a country that is purely French-Canadian.

Montmagny is an important centre for the trade of the surrounding country. Between the villages, as they are passed in succession, may be seen the long, narrow farms, with their quaint cottages and low-lying outbuildings. The explanation of their peculiar form is simple enough, when it is understood that these farms, originally of fair width, have from time to time been divided among heirs by the simple process of running the lines from front to rear, so as to give each a share of the frontage on the highway.

Montmagny.

Intercolonial Ry.—Murray Bay from the hillside.



Intercolonial Ry.—Interior of sleeping car.

Intercolonial Ry.—Restigouche Club—The junction of Matapedia and Restigouche rivers.

In each village is the parish church and its accompanying religious buildings, substantial edifices of stone. The people of this part of Canada are industrious, peaceful and plain in their tastes. All speak their mother tongue, and all have a fervent adherence to their mother church. In these particulars they are very much as were their forefathers of early Canada, but evidences are plentiful that modern improvements have been introduced in their methods of farming and conducting business.

Riviere Ouelle.

At Riviere Ouelle junction connection is made with the Intercolonial short line to Murray Bay, via Riviere Ouelle wharf and steamer across the St. Lawrence. The service is performed by Government S.S. Champlain.

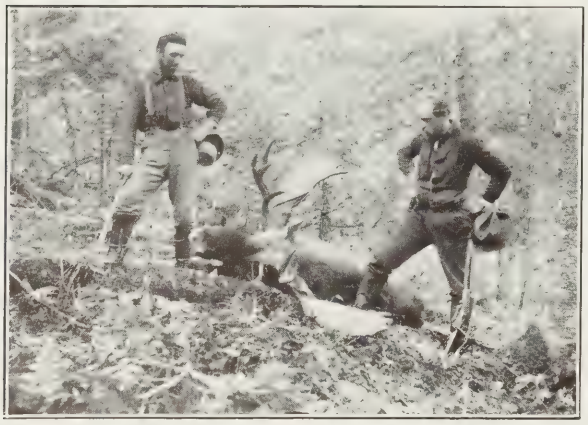
Murray Bay.

Murray Bay is one of the most delightful of the many beautiful summer resorts on the river St. Lawrence, and is largely patronized every summer by people of wealth and fashion, who annually enjoy its health-giving climate, its lovely scenery and its unrivalled facilities for boating and bathing. During the summer two daily trains are operated between Montreal and Riviere Ouelle wharf, in each direction, connecting with the steamer for the sail across the broad bosom of the mighty St. Lawrence, affording an opportunity of reaching the spot by a short, comfortable and pleasant route.

Riviere du Loup and

Continuing the journey along the south shore of the lower St. Lawrence, the Intercolonial makes its way among picturesque French-Canadian villages, and reaching such well-known sum-

Intercolonial Ry.—A North Shore catch—New Brunswick.



Intercolonial Ry.—A New Brunswick moose.

Intercolonial Ry.—Fishing in New Brunswick.

Intercolonial Ry.—Baddeck, N.S

Cacouna. mer resorts as Riviere du Loup, Cacouna and Little Metis, with other places most attractive to tourists. Beyond these it traverses the Matapedia valley and enters upon the great salmon and trout fishing region. This includes the Matapedia and other streams in Quebec, as well as the Cascapedia and other noted rivers in Gaspe, with the famed Restigouche, Nipisiguit and Miramichi in New Brunswick. The Restigouche is the boundary river between the two provinces, and after passing Campbellton the railway runs along the shore of the Baie des Chaleurs. On the opposite side of this wonderful haven is seen the Gaspe peninsula, the land of bold and impressive scenery. On the New Brunswick side such places as Dalhousie and Bathurst have much to attract, while further on are the flourishing towns of Newcastle and Chatham. From any of these towns the great moose hunting and big game territory of the north shore of New Brunswick may be reached. Near Bathurst are the celebrated iron mines owned and operated by the Canada Iron Corporation, Limited.

Baie des Chaleurs

From Chatham, the Fredericton section of the Intercolonial runs through the famous Miramichi district to Fredericton, the beautiful capital of the province, on the river St. John, and along this line is wonderful scenery and every opportunity for good sport. This is one of the chief centres of New Brunswick's great lumbering industry, and enormous quantities of sawn timber are annually exported from Chatham and Newcastle. Moncton, halfway between Campbellton and Halifax, is the headquarters of the

Fredericton

Moncton.

Intercolonial Ry.—Halifax from Georges Island.

Intercolonial Ry.—Elevator at St. John, N.B.

Intercolonial Railway—Interior of dining car.

Intercolonial Railway, and the second city in size and importance in New Brunswick. Advantageously situated on the Petitcodiac river, and being centrally located between the most fertile portions of Nova Scotia and New Brunswick, it has fine opportunities for trade and commerce. Moncton derives much of its prosperity from the presence there of the offices and workshops of the railway, as about 3,600 employees make their home here. Recent discoveries of natural gas near the city and the piping of the same to the city for power and fuel purposes bring promise of a greater industrial future for the city. The "Tidal bore" of the Petitcodiac river is one of the attractions for visitors.

West from Moncton the railway runs 89 miles to St. John, the commercial metropolis of New Brunswick. The route is through a good farming land, and in the numerous villages passed, evidences of prosperity are not lacking. At Salisbury connection is made with the Salisbury and Albert railway for Albert. A visit to this section is interesting, and by this route the picturesque rocks at Hopewell cape may be visited. River Glade is in the centre of a good farming district. Petitcodiac is a thriving village, from which the Elgin and Havelock railway runs to Elgin and Havelock.

From Petitcodiac until Sussex is reached the best of the country is not seen from the train. There is good fishing and shooting in this section, and from any of these stations, the Canaan woods can easily be reached.

Sussex.

Sussex is a thriving town in the midst of a fertile vale. The government military camp, one of the finest in Canada, is situated here. From Hampton the St. Martins railway runs to St. Martins on the bay of Fundy coast. From here to St. John pretty suburban villages are seen, and there is a splendid view of the broad stretch of the Kennebecasis river as it nears the river St. John.

St. John, N. B.

St. John, the city founded by the Loyalists in 1783, has a history dating back to the time when the land was Acadia, and the banner of France waved from Fort La Tour. Almost destroyed by the great fire of 1877, St. John was rebuilt in a solid substantial manner, and now displays a commercial activity that attracts attention. One of the chief Atlantic ports of Canada, St. John is the terminus of both the Intercolonial and Canadian Pacific railways. Both have elevators and terminal facilities here and an enormous quantity of merchandise is exported and imported annually. St. John is also to be the Atlantic port terminal for the Grand Trunk Pacific.

Preparations have already been commenced for a plan of harbour extension on a scale involving the expenditure of over $7,000,000.

Besides the Royal Mail Steamers of the Allan line and Canadian Pacific line, other steamers of these companies berth regularly at the Sand Point terminals, making the port the gateway for thousands of immigrants, and the outlet for the export of millions of tons of Canadian products. Steamers of the Donaldson line, Furness-Withy line and Head line ply regularly between St. John and European ports. Steamers of the Canada Mexican line bring St. John in touch with Mexican and Central American ports, and by the Canada South African line direct shipments are made to South Africa. There is a line to New Zealand also, and besides these there are numerous freighters giving St. John a commercial connection with all parts of the world. The Pickford and Black steamers carry passengers and freight between here and the West Indies. There is an excellent steam-

ship service to Digby, N.S., and steamer connections to the various ports of the bay of Fundy. Besides these there are still to be seen in the harbour many square rigged vessels, while countless schooners arrive and clear at the port daily.

St. John harbour is spacious and deep, and is navigable at all seasons and times. The St. John river, after a flow of 450 miles, discharges its flood into the harbour. through a narrow rocky gorge, and here are the famous Reversing falls. The scenery around St. John is entrancing, and the climate delightfully cool in summer. There are fine facilities for sea bathing right within the city limits, and at the bay of Fundy shore, only a short distance away. At the north end of the city, commonly called Indiantown, fine steamers can be taken for points up the river, and a sail up this magnificent waterway is something to delight and impress the visitor. It is 84 miles by water to Fredericton, the capital of the province, a very beautiful city of some 10,000 people.

Prince Edward Island.

During the summer Prince Edward Island is reached by taking a fast and finely appointed steamer at Pointe du Chene, the terminus of a branch of the Intercolonial, 19 miles from Moncton. This steamer makes daily trips each way between Pointe du Chene, N.B., and Summerside, connecting with the Prince Edward Island railway. A daily steamer also plies between Pictou, N.S., and Charlottetown, connecting with trains of the Intercolonial and Prince Edward Island railways. Of the island itself no brief mention can give an adequate idea. It is rich in all that pertains to agriculture, and to the summer visitor it is an ideal place of refreshment and rest. There is an abundance of surf bathing, trout fishing and sea fowl shooting in many parts of the island. Excellent board may be had at very reasonable rates at various summer resorts along the shores. In the winter months, after the close of ordinary navigation, Government steamers ply between Pictou and Charlottetown or Georgetown.

Beyond Painsec junction, on the main line, is Dorchester, the shiretown of the county of Westmoreland.

Sackville.

Sackville is a thriving town, which contains, besides some large industrial enterprises, Mount Allison university, the Academy, Ladies' college, Commercial college, Owens institute and Conservatory of Music. The New Brunswick and Prince Edward Island railway runs from Sackville to cape Tormentine, and it is proposed to build a car ferry from here to Prince Edward Island. A few miles beyond Sackville is the Nova Scotia boundary.

Amherst.

Amherst is a busy manufacturing town, with several large and important industries run by electrical power generated at the mouth of the Chignecto mines 12 miles away. The business part of Amherst is compactly built, and the residential portion handsome. All around is a fertile country and there are beautiful drives, the most interesting being to Fort Cumberland, Baie Verte and Tidnish. The old fort had once accomodation for 800 soldiers and was the chief of a chain of fortifications which extended over the isthmus of Chignecto. The government experimental farm is situated at Nappan, a few miles beyond Amherst, and the next station is Maccan, where the Nova Scotia coal fields are first seen. A branch railway connects the Intercolonial with the Joggins mines, which have a heavy annual output, and beyond them is Minudie, famous for its grindstones.

Parrsboro.

At Springhill junction, the Cumberland Railway and Coal Co.'s line runs to Springhill mines and Parrsboro. A large quantity of bituminous coal of high grade quality is mined at Springhill. Parrsboro is the shipping port.

From Oxford junction a branch of the Intercolonial runs to Pictou serving the territory bordering on this part of Northumberland strait. This branch connects with the Pictou branch line to Stellarton.

From Oxford junction the route to Truro lies over the Cobequid mountains, an altitude of nearly 700 feet above the level of the sea. The beautiful Wentworth valley lies between Westchester and Folleigh lake.

Three miles from Londonderry station are the extensive iron works at Acadia Mines.

Truro. Truro is an active town with several important industries, and is an important railway centre, being the junction point for trains to and from the Sydneys and also to Halifax. The Dominion Atlantic trains connect here with the Intercolonial railway.

From Truro to Halifax the route is through a rich farming district.

Halifax, the capital of Nova Scotia, is one of the Intercolonial's chief terminal points.

Halifax. The city is substantially built on a peninsula, and has one of the finest harbours in the world, where steamers and sailing ships of all nations may be seen at anchor, or docked at the wharves which line the harbour for several miles. Halifax has a large foreign and domestic trade and many important commercial enterprises. The city is very strongly fortified, and garrisoned by Canadian troops, and with the outside defences at York redoubt and McNab's island, is generally regarded as practically impregnable, from an attack by water, at any rate. Halifax is a charming place for the summer visitor.

Halifax rivals St. John as one of Canada's winter ports. Steamers of the Allan line, Furness line and Dominion line, have regular sailings for Great Britain in the winter, and there is an efficient service by the Pickford and Black line to the West Indies. The Plant line steamers ply between Halifax and Boston and those of the Red Cross line, between Halifax and New York. There are many other steamers for points along the coast, and a steamer of the French Mail line plies between Halifax and St. Pierre Miquelon. The harbour is large enough to float all the navies of the world and is navigable at all seasons.

Dartmouth across the harbour has several important industries. It is also reached by a branch line from Windsor junction.

Dartmouth. Running easterly from Truro is that portion of the Intercolonial railway which goes to New Glasgow, Pictou, Antigonish, Mulgrave, and thence through Cape Breton to the Sydneys. New Glasgow is a town of considerable commercial and industrial importance and at Stellarton near by are extensive collieries. From Pictou, steamers run to Prince Edward

Pictou. Island, to the Magdalen Islands, and to Cape Breton points. Antigonish is the centre of an important farming district. The railway is not interrupted at the strait of Canso. The trains are conveyed across on a powerful car ferry built and designed for the purpose. The scenery through the beautiful Bras d'Or lakes is entrancing. The industrial importance of Sydney

Sydney. is largely due to the extensive operations of the Dominion Iron and Steel company, combined with the large mining output of the surrounding collieries. This portion of Cape Breton has been the scene of great development during the past ten or twelve years, and the promise of future growth is equally encouraging. Glace Bay is the centre of the operations of the Dominion Coal company and is growing rapidly in size and importance.

Louisburg. From Sydney the historic town of Louisburg is reached by rail. From North Sydney there is the steamship line to Newfoundland, and steamers run to St. Pierre Miquelon and other points.

RATES OF INTERCOLONIAL RAILWAY.

	Miles.	Single.	Return.
Montreal to Halifax	837	18.45	27.70
Montreal to St. John	741	17.05	22.50
" Levis	163	4.90	7.35
" Fredericton	687	15.80	22.30
" Sydney	990	21.90	32.85
" Moncton	651	15.00	22.50
" Truro	775	17.85	26.80

Intercolonial Ry.—Mulgrave, N.S.

LOCATION OF STEAM RAILWAYS OF THE DOMINION OF CANADA TO JUNE 30, 1911. (Report of Railway Statistics).

Name of Railway.	Description.	Distance. Miles.	Total.
Alberta Railway and Irrigation Co.	From Lethbridge, Alberta, to Coutts, on International boundary	64·61	
	Stirling to Cardston	47·21	
			111·82
Albert Southern (abandoned)	Harvey Branch Junction to Alma, N.B.	16·00	
	Harvey Branch, Albert, to Harvey Bank, N.B.	3·00	
			19·00
Algoma Central and Hudson Bay	Sault Ste. Marie to Chippewa—Main line	69·35	
	Branch—Michipicoten to Helen Mines	10·29	
	" Josephine Junction to Josephine Mine	10·00	
			89·64
Algoma Eastern, formerly Manitoulin and North Shore	Sudbury to Cream Hill	22·70	
Atlantic, Quebec and Western	Paspebiac to end of steel		52·25
Baie des Chaleurs in Atlantic and Lake Superior System (now Quebec Oriental)	Matapedia Station on I.C.R. to Paspebiac		100·00
Bay of Quinte Railway	Deseronto to Bannockburn	76·00	
	" west of Deseronto	2·00	
	Yarker to Sydenham	11·39	
			89·39
Bedlington and Nelson	International boundary at Port Hill to Jct. Can. Pac. Ry. at Creston, and from Jct. with C.P.R. at Sirdar to Kuskanook		15·30
Brandon, Saskatchewan and Hudson Bay	International boundary at Bannerman to Brandon, Man.		69·45
British Yukon	White Pass to Whitehorse Spur, B C.	90·32	
	Macrae to Pueblo	10·80	
			101·12
Buctouche and Moncton	Moncton, on Intercolonial Railway, to Buctouche, N B.		34·00
Brockville, Westport and North Western	Brockville to Westport, Ont.		45·00
Bruce Mines and Algoma	Town of Bruce Mines to Rock Lake Mine		17·28
Canada Southern	Main Line—Windsor, Ont., to Suspension Bridge, Niagara Falls	226·18	
	Amherstburg Branch—Essex Centre to Amherstburg	16·83	
	St. Clair Branch—St. Clair Junction to Courtwright	60·48	
	Fort Erie Branch—Fort Erie to Welland Junction	17·50	
	Erie and Niagara Branch—Old Fort Erie to Niagara	30·60	
	Oil Springs Branch—Oil Springs to Oil City	5·50	
Leased	Sarnia, Chatham and Erie—Oil City to Petrolia	7·00	
"	Leamington and St Clair—Comber to Leamington	15·95	
			380·04
Canada Eastern, now included in Intercolonial Railway	Late Northern and Western of New Brunswick		
	Fredericton to Loggieville	125·00	
Cape Breton Railway	Point Tupper to St. Peters	30·00	
	Terminal to St. Peters	1·00	
			31·00
Caraquet	From Gloucester Junction, Intercolonial Railway, 5 miles south of Bathurst Station, easterly along the south shore of Baie des Chaleurs to Shippigan Harbour, N.B.		68·00
Carillon and Grenville	Carillon to Grenville, Que., connecting at both termini with Ottawa River Navigation Company's steamers (Gauge, 5 ft. 6 in)		13·00
Central Ontario	Picton to Trenton Junction	32·17	
	Trenton Junction to Coe Hill	72·60	
	Ormsby Junction to Maynooth	35·36	
			140·13
Crows Nest Southern	International Boundary at Gateway to Michel, B C.		74·18
Cumberland Railway and Coal Company (formerly Spring Hill and Parrsboro').	Spring Hill Junction, Intercolonial Railway, to Spring Hill Coal Mines, N.S. and Parrsboro', on the Bay of Fundy		32·00

LOCATION OF STEAM RAILWAYS—Continued.

Name of Railway.	Description.	Distance. Miles.	Total.
Dominion Atlantic, comprising Windsor and Annapolis, Yarmouth and Annapolis and Cornwallis Valley and lease of Windsor Branch of Intercolonial and Midland of Nova Scotia	Windsor to Yarmouth	170·78	
	Branches—		
	Wilmot to Torbrook	5·26	
	From Kentville to Kingsport, on Basin of Minas (formerly Cornwallis Valley Railway)	14·15	
	Windsor Branch of I.C.R.—Windsor to Windsor Junction, Intercolonial Railway, 14 miles from Halifax, leased	31·17	
	Windsor to Truro	57·21	
			278·87
Eastern British Columbia	Corbin to McGillivray, B.C.	14·00	
	Branches	2·00	
			16·00
Elgin and Havelock	From Elgin, County of Albert, N.B., to Petitcodiac Junction with Intercolonial Railway; thence to Havelock in County of Kings, N.B.	27·00	
	Havelock to Keith's Mills	1·00	
			28·00
Esquimalt and Nanaimo	Victoria to Wellington, Island of Vancouver		78·00
Fredericton and St Mary's Ry. Bridge, now in Intercolonial Ry	Over the St John River, connecting the Fredericton Railway, at Fredericton, with the New Brunswick Railway, and Canada Eastern Ry., at St. Mary's.		
Grand Trunk (owned)—			
Eastern Division		722·88	
Northern Division		884·64	
Middle Division		1,080·50	
Southern Division		245·55	
			2,933·66
Leased and partly owned	Buffalo and Lake Huron Ry.		
	Fort Erie to Goderich	161·30	
			161·30
	Total mileage owned and leased		3,094 96
St Clair Tunnel and approaches	Under the St Clair River, between Sarnia and Port Huron—connecting the Grand Trunk Railway with railroads in State of Michigan (Length of tunnel between portals 6,000 ft, cylindrical in section with clear inside diameter of 19 feet 10 inches)		2·25
Grand Trunk Pacific	Under construction.		
Gulf Shore, now Caraquet	Junction with Caraquet Railway at Pokemouche to Tracadie		16·78
Halifax and Southwestern, formerly Nova Scotia Southern, including Central Nova Scotia, Halifax and Yarmouth and Middleton and Victoria Beach, and Liverpool and Milton	Halifax to Yarmouth	246·60	
	Mahone Junction to Lunenburg	7 00	
	Bridgewater Junction to Middleton Junction	92·05	
	New Germany Junction to Caledonia	22·10	
	Liverpool to Rapid Falls	4·85	
	Nictaux to Forbrook Mines	4·16	
	Shelburne to Battery Point Wharf	1·11	
			377·87

LOCATION OF STEAM RAILWAYS—Continued.

Name of Railway.	Description.	DISTANCE. Miles.	Total.
Hereford	From International Boundary to Lime Ridge, Quebec, connects with Canadian Pacific Railway at Cookshire, Maine Central at International boundary, and with Quebec Central at Dudswell		52·18
Interprovincial Railway, bridge and approaches, now included in Ottawa, Northern and Western	Across the Ottawa River at City of Ottawa	1·40	
Irondale, Bancroft and Ottawa	From Junction with Grand Trunk Railway near Kinmount Station, to Junction with Central Ontario Railway		51·00
Inverness and Richmond, now Inverness Railway and Coal Co	Inverness to Point Tupper Junction		60·91
Kaslo and Slocan	From Kaslo to McGuigan, B.C.	23·18	
	Branches	0·19	
			23·37
Kent Northern	Richibucto, N.B., to Kent Jct., Intercolonial Railway		27·00
Kettle Valley	Carson to Lynch Creek, B.C.		22·20
Kingston and Pembroke	Main Line Kingston to Renfrew	103·40	
	Glendower Branch—Bedford to Zanesville Mine	4·10	
	Robertsville Branch—To Robertsville Mines	0·90	
	Branches—To Doran's Mills, Charcoal Works, McLaren's Mills, Bethlehem Iron Mines, Lavant Mills, Clyde Forks Mills, Wilson's Mine, Carswell's Mills, William's Mine, Cameron Bay		
	(Connects with Grand Trunk at Kingston, Canadian Pacific at Sharbot Lake and at Renfrew)	1·40	
			109·80
Klondike Mines	Dawson City to Sulphur Springs		31·81
Lenora Mount Sicker	Lenora Mines to Crofton, B.C.		12·00
Lotbiniere and Megantic	Lyster Station, Grand Trunk, to St. Jean des Chaillons		30·00
Lake Erie and Detroit River	Walkerville, Ont., to St. Thomas	126·78	
Erie and Huron	Rondeau to Sarnia	72·03	
			198·81
London and Port Stanley	London to Port Stanley on Lake Erie		23·66
Magnetawan River	Burks Falls, on Grand Trunk Ry., to Magnetawan River		1·91
Maritime Coal, Railway and Power Co.	Maccan to Joggins Coal Mine		15·00
The Manitoba Ry., formerly—The Northern Pacific and Manitoba, the Winnipeg Transfer Ry., the Portage and Northwestern, the Waskada and Northeastern leased to Govt. of Manitoba and operated by the Canadian Northern	International boundary to Winnipeg, and branches		350·68
Marmora Ry. and Mining Co., operated by Central Ontario	Central Ontario Junction to Wanston		9·60
Midland of Nova Scotia (formerly Stewiacke Valley)	From Windsor to Truro, N.S., *see* Dominion Atlantic Railway		
Massawippi Valley	From Lennoxville to Vermont boundary, there connecting with Connecticut and Passumpsic Rivers Railway; also connects with Grand Trunk and C.P.R. at Lennoxville	31·95	
	Branch—Stanstead Junction to Stanstead	3·51	
			35·46
Midland of Manitoba, now Great Northern	International Boundary at Gretna to Portage la Prairie	76·52	
	International Boundary near Haskett to Morden	15·25	
			91·77
Montreal and Vermont Junction	From Junction with Stanstead, Shefford and Chambly Railway, 2½ miles east of St. Johns, P.Q., to Junction with Vermont and Canada Railway, at Vermont boundary; also connects at Stanbridge with Lake Champlain and St. Lawrence Junction Railway		23·60
Montreal, Portland and Boston, now Montreal and Province Line	Junction with Grand Trunk at St. Lambert to Farnham	32·00	
	Marieville to Cesaire	8·60	
	Farnham to Freligsburgh	18·00	
			58·60

LOCATION OF STEAM RAILWAYS—Continued.

Name of Railway.	Description.	Distance. Miles.	Total.
Montreal and Atlantic (formerly South-eastern)	Main Line—Farnham to Richford on International Boundary	43·70	
	Drummondville Junction to Drummondville	59·20	
		102·90	
	Leased—Lake Champlain and St. Lawrence Junction—Stanbridge to St. Guillaume	60·50	
			163·40
	(Connects with Connecticut and Passumpsic, Grand Trunk and Stanstead, Shefford and Chambly Rys.)		
Morrissey, Fernie and Michel	From Swinton to Carbonado, B.C., and leased line		10·85
Napierville Junction	St. Constant Junction to Rouse's Point		27·06
Nelson and Fort Sheppard	From Troup Junction to Waneta on International Boundary, B.C.		55·42
New Glasgow Iron, Coal and Railway Co., now Nova Scotia Steel and Coal Co.	From Ferrona Junction, I.C.R., to Sunny Brae		12·50
New Brunswick and Prince Edward Island	From Sackville Station, Intercolonial Railway to Cape Tormentine		36·00
New Brunswick Coal and Ry. Co	From Norton to Minto		58·00
New Brunswick Southern (now Canadian Pacific).			
New Westminster Southern	Douglas to South Westminster		23·73
North Shore	Adamsville to Mount Carlyle		8·63
Nosbonsing and Nipissing	From Lake Nosbonsing to Lake Nipissing		5·50
Orford Mountain (now Can. Pacific Ry.)			
Ottawa and New York	From Ottawa to International Boundary near Cornwall		56·90
Pembroke Southern (leased to Canada Atlantic)	From Pembroke to Golden Lake		21·36
Phillipsburg Ry. and Quarry Co.	Stanbridge Station of Canadian Pacific and Central Vermont Railways, to Philipsburg, Missisquoi Co		6·00
Pontiac and Renfrew	From Wyman's Station, on Pontiac Pacific Junction Ry., to Bristol Iron Mines, County Pontiac, Que		4·25
Princeton Branch of Washington Co., Ry., (U.S.)	International Boundary near Waring to International Boundary near Woodland		5·10
Qu'Appelle, Long Lake and Saskatchewan (in Canadian Northern System)	From Canadian Pacific Railway at Regina, Northwesterly to Long Lake and Prince Albert		250·02
Quebec Bridge and approaches to connect adjacent railways	(Across St Lawrence River at Quebec, under construction 10 miles)		
Quebec and Lake St. John	Quebec to Chambord Junction	176·00	
	Chambord Junction to Chicoutimi	51·00	
	Valcartier to Clarks	5·50	
	Chambord Junction to Roberval	13·30	
	La Tuque Junction to La Tuque	39·70	
	Roberval to Roberval Wharf	1·00	
			286·50
Quebec Central	Main Line—Sherbrooke to Harlaka Junction, Intercolonial Railway 5 miles from Levis, Quebec	138·00	
	Beauce Junction to St Sabine	55·00	
	Tring Megantic—Tring Junction to Megantic	60·00	
	(Connects with Grand Trunk, Canadian Pacific and Boston and Maine Rys. at Sherbrooke)		253·00
Quebec and New Brunswick	From Chaudiere Junction to Connors, N.B., 135 miles (3 miles under construction)		

LOCATION OF STEAM RAILWAYS—Continued.

Name of Railway.	Description.	Distance. Miles.	Total.
Quebec, Montmorency and Charlevoix	Hedleyville, Parish of St. Roch, Quebec, to Cap Tourmente		27·00
Quebec, Montreal and Southern, comprising East Richelieu Valley Railway and United Counties	Noyan Junction to Bellevue Junction	80·82	
And South Shore Railway	From Fortierville Junction with Grand Trunk at St. Lambert	109·69	
	St. Constant Junction to Napierville Junction	1·40	
			91·91
Red Mountain	From International boundary line at Patterson, B.C., to Rossland		9·59
Restigouche and Western, now International of New Brunswick	Campbellton, N.B., to St. Leonard's		113·50
Rutland and Noyan	International boundary to Noyan Jct		3·39
Stanstead, Shefford and Chambly	From Junction with Montreal and Vermont Junction Railway, near St John, Que., easterly to Waterloo		43·00
St. John Bridge and Railway Extension, now leased by Canadian Pacific Ry	From St. John to Fairville, crosses St. John River at the Falls by a cantilever steel bridge, and connects Intercolonial Railway with New Brunswick Railway, C.P.R., included in Canadian Pacific System, 2·00 miles		
St. John Valley and Riviere du Loup	From Fredericton, N.B., to Woodstock, N.B., 66 miles, of which 6 miles are built		
Salisbury and Albert (formerly Albert Railway)	Salisbury to Albert, N B		15·00
Schomberg and Aurora	Bond Lake, Ont., to Schomberg		14·40
St. Lawrence and Adirondack	From Jct. with Canada Atlantic near Valleyfield to International boundary	19·92	
	Beauharnois to Junction with Canadian Pacific at Adirondack Junction	12·90	
	Leased—Valleyfield to Beauharnois	13·30	
			46·12
St. Martins	Hampton to St. Martins		30·00
Sydney and Louisburg (Dominion Coal Co.)	Sydney Harbour to Louisburg Harbour	39·00	
	Branches to coal mines	22·77	
	Spurs	2·29	
			64·06
St. Mary's River, now Alberta Railway and Irrigation Co			
Temiskaming and Northern Ontario	North Bay to Cochrane	252·80	
	Englehart to Charlton	7·80	
	Cobalt to Kerr Lake	3·90	
	Haileybury to Moore's Cove	1·64	
	Iroquois Falls to South Porcupine	28·00	
	Liskeard to Lake Temiskaming	·64	
			294·78
Thousand Islands	Gananoque on St Lawrence River to Thousand Island Junction		6·33
Temiscouata	Riviere du Loup, Que., to Edmundston, N.B., on the New Brunswick Railway	81·00	
	Branch—Edmundston to Connors, on St. John River	32·00	
			113·00
Tilsonburg, Lake Erie and Pacific	Port Burwell to Ingersoll, now in Can. Pac. Ry		

LOCATION OF STEAM RAILWAYS—Concluded.

Name of Railway.	Description.	Distance. Miles.	Distance. Total.
Toronto, Hamilton and Buffalo, including Brantford, Waterloo and Lake Erie	Waterford Jct. with Canada Southern to Welland Junction with Canada Southern—passing through the city of Hamilton	79·88	
	Hamilton to Grand Trunk Junction	0·27	
			80·15
Victoria and Sydney	Victoria to Sidney, B.C.		15·97
Victoria Terminal Railway and Ferry	City of Victoria		·91
Vancouver, Victoria and Eastern	Laurier to Danville	16·47	
	Grand Forks Junction to Phœnix	25·82	
	Grand Forks to Granby Smelter	4·74	
	Midway to International Boundary	28·89	
	Chopaka to Princeton	59·11	
	International Boundary to S. Westminster	21·05	
	International Boundary to Port Guichon	46·60	
	New Westminster to Vancouver	14·79	
	Burrard Inlet to Vancouver	1·93	
			219·40
Wellington Colliery	Union Bay to Cumberland		10·75
York and Carleton	Junction with Canada Eastern Ry. at Cross Creek Station to Ryan Brook, N.B.		10·50
	Total mileage		25,399·86

Northern Navigation Company—McGregor bay, near Little Current, Ont.

STEAMBOAT LINES RUNNING EASTWARD FROM FORT WILLIAM AND PORT ARTHUR.

CANADIAN PACIFIC RAILWAY COMPANY'S STEAMBOAT LINE.

The Canadian Pacific Railway Company operates a fine and well equipped line of lake steamers from Fort William, Port Arthur and Georgian bay ports and connecting with the Railway line. This line is described under the heading "Canadian Pacific Railway" and want of space prevents recapitulation here. The line is well known and like all appointments of the company it provides first class accommodation for tourists and travellers who prefer an alternative route in summer.

THE NORTHERN NAVIGATION COMPANY.

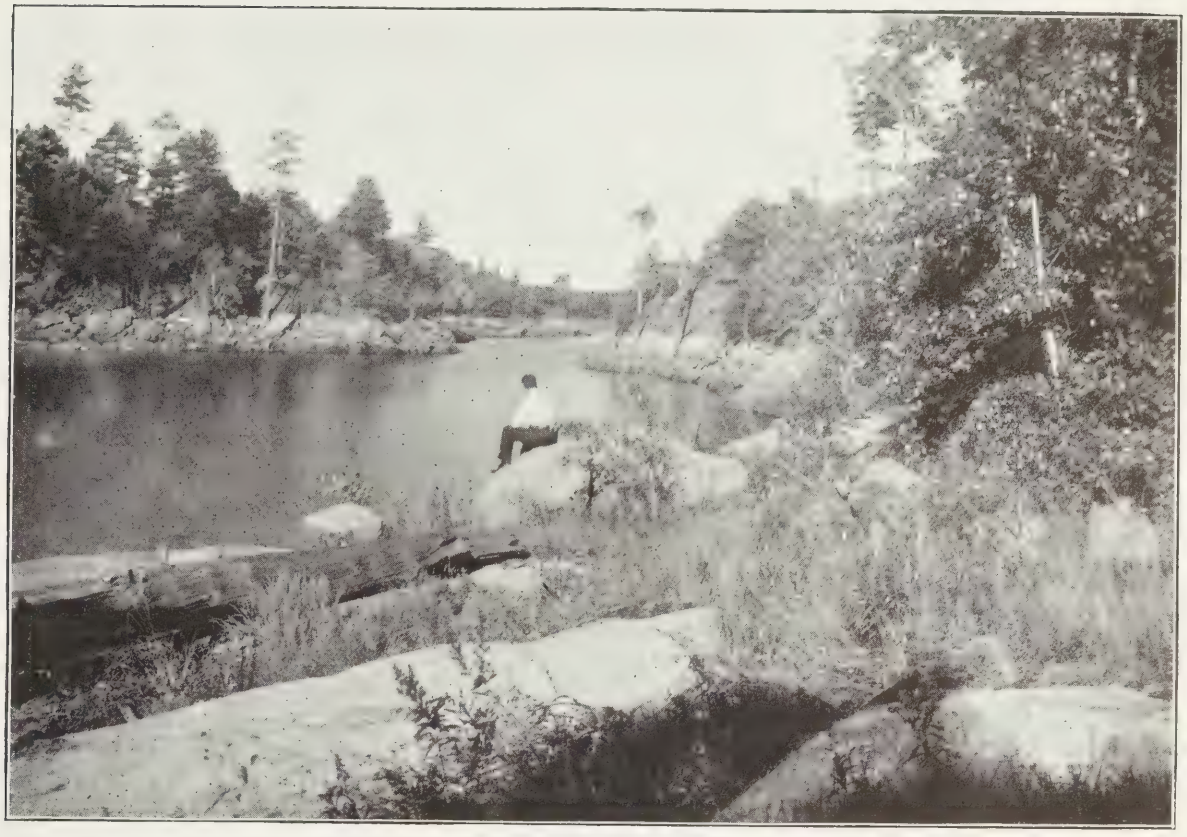
The Northern Navigation Co., one of the pioneer Canadian transportation companies, operates its fleet of nine vessels on lakes Huron, Superior and Georgian bay. The service is divided into three divisions, designated as follows:—

LAKE SUPERIOR ROUTE,
GEORGIAN BAY AND MACKINAC ROUTE,
30,000 ISLAND ROUTE.

The lake Superior route is served by the passenger steamers, "Sardonic," "Huronic" and "Hamonic," which operate between Sarnia, Sault Ste. Marie, Port Arthur, Fort William and Duluth. The steamers leave Duluth every Tuesday and Saturday and Port Arthur and Fort William every Wednesday, Friday and Sunday. The route taken is from Duluth to Port Arthur and Fort William, thence to S. S. Marie, and Sarnia. At the latter point, connection is made with the Grand Trunk Railway system. Special trains leave the steamer's dock for Toronto and intermediate points immediately after the arrival of the steamers.

The White Star line steamers for River St.

Northern Navigation Company—Muskosh river.



Northern Navigation Company—"Go Home" river.

Clair ports and Detroit also leave from the same dock.

Connection is also made at S. S. Marie with the Georgian bay and Mackinac route. This route is served by the steamers "Majestic," "City of Midland" and "Germanic," covering the territory between Mackinac Island, S. S. Marie, Owen Sound, Collingwood and Parry Sound and the ports of call in the famous North channel of the Georgian bay, giving a service of three round trips a week.

Steamers will leave Mackinac island every Sunday, Tuesday and Thursday and S. S. Marie every Monday, Wednesday and Friday. Connection is made at Owen Sound with the Grand Trunk railway and Canadian Pacific railway, and at Collingwood with the Grand Trunk railway. Passengers going through to Parry Sound can there commence the trip covered by the 30,000 Island route, service on which is performed by the new twin screw steel steamer, "Waubic," built especially for this route. This steamer makes round trip daily (Sunday excepted) between Parry Sound and Penetang, connecting at the latter port with special Grand Trunk railway trains which leave from the same dock, for Toronto, Buffalo and intermediate points.

The service on all routes of the Northern Navigation company is maintained at a very high standard and no expense is spared to make it the best on the Great Lakes.

The "Hamonic," the flag ship of and the latest addition to the fleet has in speed, luxury, comfort and appointments, proven herself to be equal to any of the modern leviathans of the Atlantic service, and the other steamers are equipped to measure up to the high standard set by the company.

Space will not permit of any further detailed description, but folders and other literature can be secured from any ticket agent.

Below will be found rates between various ports and time tables.

Northern Navigation Company—Dining Room—S. S. "Hamonic."

Northern Navigation Company.—Grand saloon—S. S. "Hamonic."

Northern Navigation Co.—S. S. Hamonic—Lake Superior route.

Northern Navigation Co.—S. S. Majestic—Georgian Bay and Mackinac route.

Northern Navigation Co.—S. S. Huronic—Lake Superior route.

Northern Navigation Company—Inside channel, Georgian bay.

Northern Navigation Company—Indian berrypickers' camp, McGregor bay.

Northern Navigation Company—Bridal Veil falls, Kagamong, Ont.

Northern Navigation Company—McGregor bay.

The rates quoted all include meals and berths except on the 30,000 Island route.

Stateroom accommodation can be reserved in advance, by application to the company's office at Collingwood, Sarnia, Winnipeg, Duluth or Port Arthur, and requests for same will be given most careful attention.

RATES.	One Way.	Return.
Duluth to Port Arthur	$8 00	$14 00
" S. S. Marie	13 00	22 00
" Sarnia	22 00	37 50
" Owen Sound or Collingwood	25 00	42 00
" Parry Sound	27 75	47 00
Port Arthur to S. S. Marie	10 00	18 00
" Sarnia	18 50	32 00
" Owen Sound or Collingwood	22 00	38 00
" Parry Sound	24 75	43 00
S. S. Marie to Sarnia	9 00	16 00
" Owen Sound or Collingwood	12 00	20 00
" Parry Sound	14 75	25 00
Parry Sound to Penetang	2 00	3 50

NIAGARA NAVIGATION COMPANY.

The steamers at the height of the season make six round trips daily between Toronto, Canada, Niagara-on-the-Lake, Canada, Queenston, Canada, and Lewiston, N.Y.; trip is 40 miles across lake Ontario, and seven miles up the beautiful lower Niagara river. Connection can be made at any of the last three-mentioned points for Niagara Falls and Buffalo. The rate one way from Toronto to Niagara Falls is $1.55; round trip, good two days, $2.00, 30 days, $2.35.

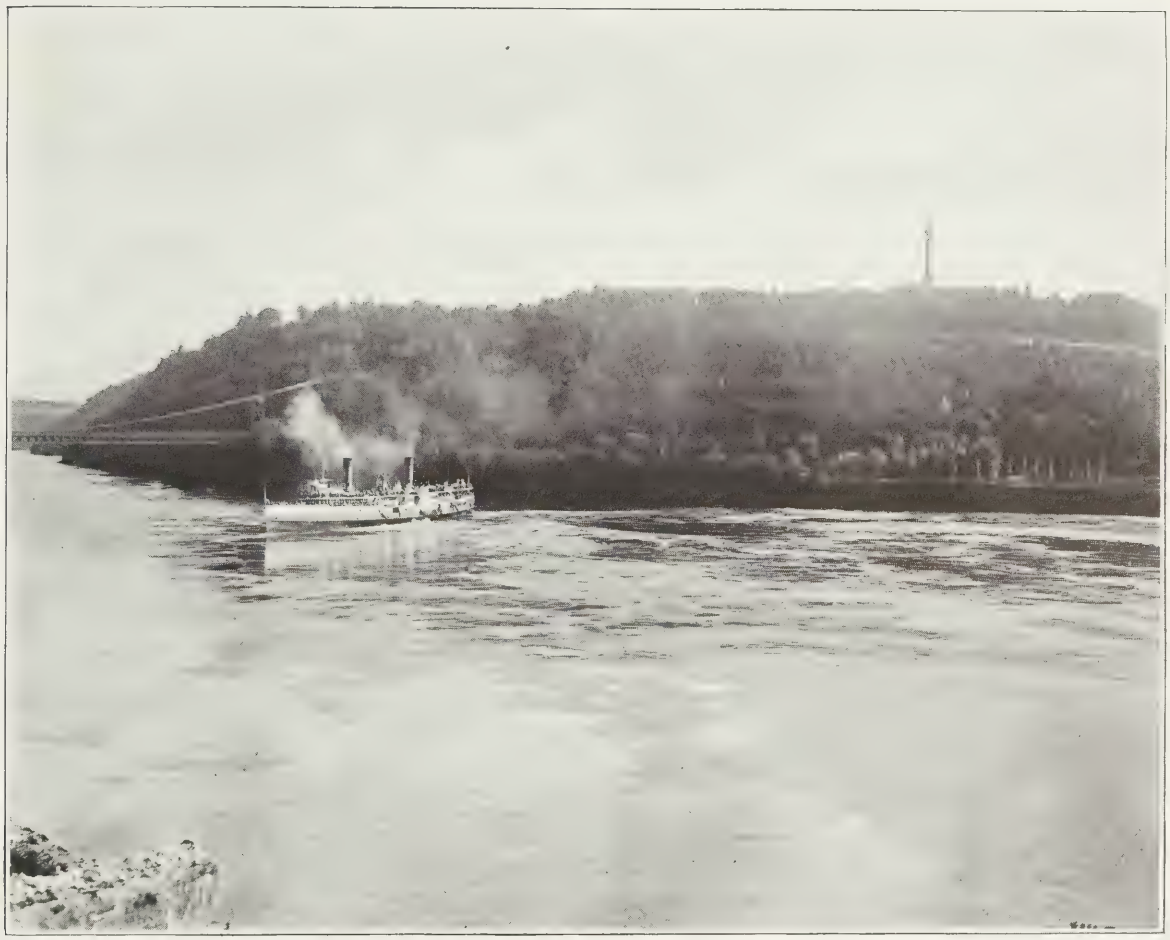
RATES.

	One Way.	Return.
Toronto to Niagara-on-the-Lake	$1.00	$1.50
" Lewiston or Queenstown	1.25	2.00
Niagara-on-the-Lake to Lewiston or Queenstown	.25	.50

Niagara Navigation Company—Steamer "Corona."

A Niagara Navigation Company steamer.

Niagara Navigation Company—A part of the fleet.



Niagara Navigation Company—On the Niagara river—The Brock monument can be seen in the distance.

Niagara Navigation Company—Steamer Chippewa.

THE LAKE ONTARIO AND BAY OF QUINTE STEAMBOAT COMPANY, LIMITED.

The routes operated by the Lake Ontario and Bay of Quinte Steamboat Company, Limited, afford an easy and convenient means of travel between that portion of the United States whose natural point of entry and exit is Charlotte, N.Y. (port of Rochester), and the central portion of the province of Ontario contiguous to the lake, including the summer resorts of the Kawartha lakes, Bay of Quinte, and the Thousand Islands.

The Company operates the SS. "North King" and SS. "Caspian," maintaining the following regular services:

Charlotte. (1) Lake route from Charlotte, N.Y. (port of Rochester), to Cobourg and Port Hope, Ont., connecting with the Grand Trunk Railway system for all points, including the Kawartha lakes. On the American side connection being made at Rochester, N.Y., with the New York Central and Hudson River Railroad, Pennsylvania Railroad, and Buffalo, Rochester and Pittsburgh Railway.

Cobourg and Port Hope. The steamers leave Charlotte, N.Y. (port of Rochester), daily except Sunday at 9.10 a.m., arriving at Cobourg, Ont., at 1.30 p.m., and Port Hope, Ont., at 2.30 p.m. Returning arriving at Charlotte, N.Y., at 7.15 p.m. With the exception of the carriage of mail and express the service is almost distinctly passenger.

(2) Route from Charlotte, N.Y. (port of Rochester), to Bay of Quinte and Thousand Island points.

At the northeastern extremity of Lake Ontario

Bay of Quinte.

an extensive peninsula, forming the county of Prince Edward in the province of Ontario, projects into the lake, enclosing a body of water over a hundred miles in length, to which the name Bay of Quinte was given during the French regime.

The Bay of Quinte district is now an agricultural paradise and the home during the summer season of thousands of tourists. While it offers unsurpassed facilities for the enjoyment of yachting, boating, bathing and swimming, the inducements it holds out to the angler surpass all its other attractions—maskinonge, bass, and other fish abound in its waters.

The SS. "North King" and SS. "Caspian" pass through the land-locked waters of the Bay en route to and from the Thousand Islands, maintaining a daily service, and the traveller finds in its picturesque scenery a constant source of pleasurable interest. Crossing Lake Ontario from Charlotte, N.Y., the steamers make their first stop on the Canadian side at Brighton, Ont., situated on the Bay of Presque Isle at the entrance to the Murray canal. Passing through the canal, which is four and a quarter miles in length with a uniform width of about 200 feet, access is gained to the bay, and proceeding eastward regular calls are made at the following ports: Belleville, Deseronto, Picton, Glenora (Lake-on-the-Mountain), Glen Island, Adolphustown, Cressy, Conway, Bath, Stella (Amherst Island), and Kingston. Leaving Kingston the steamers enter the St. Lawrence river and make a tour of the Thousand Island region, passing down the American channel as far as Alexandria Bay, N.Y., thence crossing to Rockport, Ont., and returning by the Canadian channel to Kingston, calling at Gananoque. From Kingston the return trip is made westward to Charlotte, N.Y. (port of Rochester), calling at the Bay of Quinte ports above mentioned. The round trip covers some 420 miles, 300 of which are in land-locked waters, and is made in thirty-four hours including stops at ports.

Brighton.

Kingston.

The SS. "North King" (872 gross tons) and SS. "Caspian" (957 gross tons) are of side-wheel type, both licensed for five hundred lake passengers, and have each stateroom capacity for one hundred and fifty persons.

The following rates of passage apply from Charlotte, N.Y., or vice versa:

	One Way.	Return.
To Cobourg and Port Hope, Ont.	$2 25	$4 00
" Brighton, Ont.	2 25	3 90
" Belleville, Ont.	2 75	4 40
" Deseronto, Picton, Glenora, Glen Island, Allison's, Cressy, Conway, Bath, Stella, Kingston, Gananoque, Rockport, Ont.	3 00	4 65

Rates are exclusive of meals and berths.

THE RICHELIEU AND ONTARIO NAVIGATION LINE.

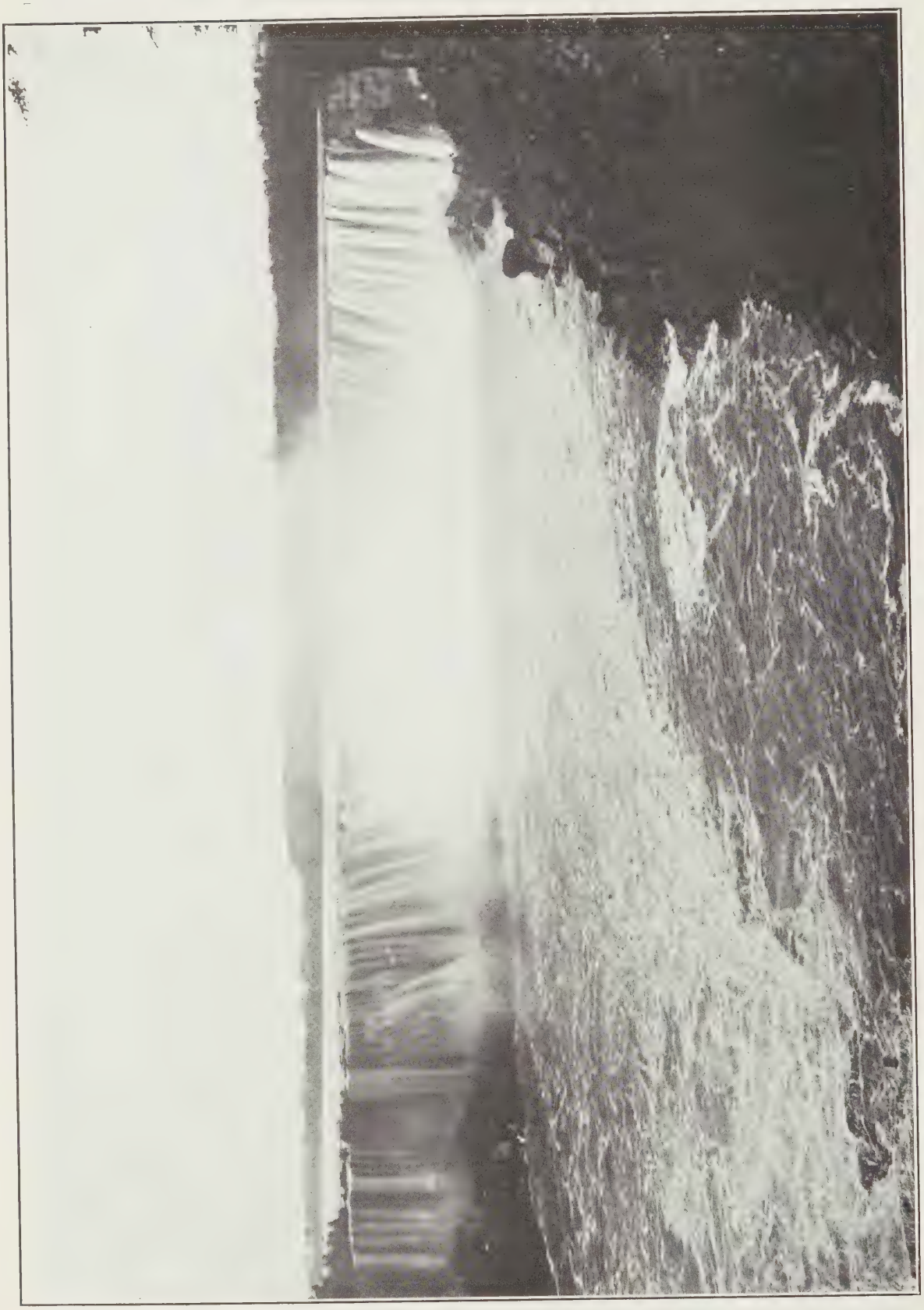
"NIAGARA TO THE SEA."

Niagara Falls.

The finest inland water trip in the world—covering 800 miles from Niagara Falls, Toronto, through Lake Ontario, the Thousand Islands, the exciting descent of the wonderful rapids of the St. Lawrence, Montreal, Quebec, the sublime scenery of the St. Lawrence below Quebec, and the Saguenay river. The most varied in scenery—the richest in historic association, which can be made on the continent.

Nowhere in the world is there an all-water trip so picturesque, or one which embraces as great a variety of attractions for the tourist as does the popular trip from Niagara to the sea. The trip in its entirety begins at the Falls of Niagara, and embraces a sail on magnificent modern steamers through the blue waters of Lake Ontario, down to and through the famed Thousand Islands, shooting the Rapids, visiting Montreal and quaint, picturesque old Quebec, and onward down to the salt waters of the mountainous and beautiful lower St. Lawrence to Murray Bay and Tadoussac; thence up through the very heart of the Laurentian mountains to Chicoutimi, located at the head of navigation on the Saguenay river, which flows from Chicoutimi to Tadoussac through a grand navigable mountain gorge.

The majestic St. Lawrence river, flowing northeast connects the world's greatest chain of lakes with the Atlantic ocean. In purity and clearness its waters surpass those of any river in



Richelieu and Ontario Navigation Company—Niagara falls.

Richelieu and Ontario Navigation Company—Another view.

America, and its historic environments are a source of intense interest to all travellers.

The climatic conditions of this famous region are, in summer, as near perfection as possible, the days of sunshine are clear and bright, and are crowned with most beautiful sunsets; the nights are cool and sleep-inducing; and the great body of water, combined with woodland and mountain breezes, cool and purify the air to such a degree that it has a subtle charm for those in search of health, rest and recreation.

Niagara Falls is usually the place first visited by tourists who desire to see the world's greatest cataract and make the grand tour of the St. Lawrence.

One of nature's greatest creations, whose shrine commands the homage of wonder-worshippers from every known land, the Falls of Niagara are a singularly fit starting point for those who purpose making the trip, being more accessible than any other point of attraction in America, because many great trunk railway lines have made Buffalo and the Falls objective points in their endeavor to secure a portion of the ever-increasing stream of summer tourist travel bound for the lordly St. Lawrence river, and the beauty spots of Canada. Tickets and information may be obtained at all principal railway, lake and river ticket offices.

Among the points of interest at Niagara Falls may be mentioned the beautiful parks on both sides of the river, Goat Island, the Whirlpool, the Cave of the Winds, etc.

Niagara Falls is well equipped with hotels, the latest addition to their number being the magnificent new Clifton hotel on the Canadian side, facing the Gorge and Falls.

The International hotel on the American side has just been rebuilt and newly furnished throughout. It is under new management and is modern and first class in every particular.

The region of the Falls, above and below, presents a series of delightful pictures. One of the most picturesque spots lies between the Whirlpool and Queenston. The Niagara gorge railway affords an excellent opportunity of seeing the principal points of interest at a very moderate outlay.

This trip is one of the principal features of a visit to Niagara Falls, and should not be missed. Observation cars are run for seven miles through the Niagara gorge, in full view of the rapids and whirlpool.

Leaving Niagara, it is a short journey, either by rail or electric car, to the historic village of Queenston. The country here is particularly interesting. On an eminence is the monument erected by Canada in honor of Sir Isaac Brock, who fell during an engagement with the American troops in 1812. On the opposite shore is the American village of Lewiston, reached by a suspension bridge.

Queenston.

From Lewiston, Queenston and Niagara-on-the-Lake the steamers of the Niagara Navigation Company run across Lake Ontario to Toronto. Other routes from the Falls to Toronto are by Grand Trunk or Michigan Central and Canadian Pacific Railways, or electric railway to Port Dalhousie and steamer.

Lewiston.

Connection is also made via New York Central R.R. to Charlotte, N.Y. thence by steamer.

The Richelieu and Ontario Navigation Company has an information bureau at 305 Main Street, Buffalo, N.Y. and at International Hotel Block, Niagara Falls, N.Y.

The Richelieu and Ontario Navigation Company's tourist steamers sail daily during the summer, via Lake Ontario, the American channel by daylight, through the Thousand Islands and all the Rapids to Montreal.

Toronto, Ont., is the capital of the province of Ontario (R. & O. Ticket Office, 46 Yonge St.) Leaving Toronto (Company's wharf, foot of Yonge Street) at 3.00 p.m. going east; the steamers cross Lake Ontario to Charlotte, N.Y. which is reached the same evening. The following morning the steamers arrive at

Toronto.

Kingston, Ont., the principal fortified point west of Quebec. After rounding Cedar island with its Martello Tower, we commence the descent of the River St. Lawrence. Wolfe island is on the right, Milton, the "Spectacles," and Howe Islands, are passed on the left, and at the east end of Wolfe island the Thousand islands proper begin. There are three main

Kingston.

Richelieu and Ontario Navigation Company—Scene on the Thousand Island route.

channels through the islands, one along the north, or Canadian shore; the middle channel near the boundary line and the south, or American channel along the shores of New York State.

Thousand Islands.

The "Thousand Islands" are 1,692 in number and extend from Lake Ontario to Prescott, 50 miles. From the deck of the Richelieu Co's steamers the traveller has a glorious opportunity of viewing the ever-changing attractions of this wonderful natural panorama. Every turn of the boat brings new views, new scenes and new life. Many of the islands are owned by wealthy people, who have built fine residences and laid out tasteful grounds. The scenery by day is grand and inspiring, while the illuminations, the music, the flashing boats, and the festivities by night make the evenings enchanting.

Brockville and Prescott.

The steamer stops at Clayton and Alexandria bay amongst the islands and then at Brockville and Prescott on the Canadian shore. At Prescott the lake steamers transfer passengers to the river steamers, to run the rapids, and west-bound passengers transfer from river steamers to lake steamers. An earth fortification here is known as Fort Wellington. The stone lighthouse east of the town was formerly an old windmill where the battle of Windmill Point was fought in 1837.

Rapids of the St. Lawrence. From the Thousand islands to Montreal the entire trip is made by daylight on the Richelieu Company's steamers, the only line running all the rapids, and there is a constant succession of pleasing views and thrilling passages.

The Galops and the Rapids du Plat are the first and least exciting, though they afford sufficient change from the smooth and steady current of the upper river to give a suggestion of the grandeur to come.

Galops Rapids.

Long Sault rapids come next. These are the longest of the great rapids, nine miles in length with first a fall of forty-eight feet and considered the greatest of them all, containing the heaviest swells in the river, especially in one part known as the "Cellar". Waves dash in the air as they meet steadfast opposition from treacherous reefs, or are hurled back to meet the force of rushing waters. The sensation experienced on board the steamer is most thrilling. The vessel suddenly shoots forward, then there is a sudden sinking, those experienced in sea and lake voyages naturally expect that the boat will rise again, but it does not. Again it rushes forward and again the sinking is felt, as if the vessel had ceased to struggle.

Long Sault Rapids.

At Cornwall, Ont., the centre of the river ceases to be the boundary between Canada and the United States. For the next thirty miles the river widens into Lake St. Francis. At the foot of the lake on the left is Coteau Landing, Que., where the little white houses and the big church denote that we are now in

Cornwall.

Richelieu and Ontario Navigation Company—Steamer "Rapids King" shooting the rapids.

Coteau Rapids.

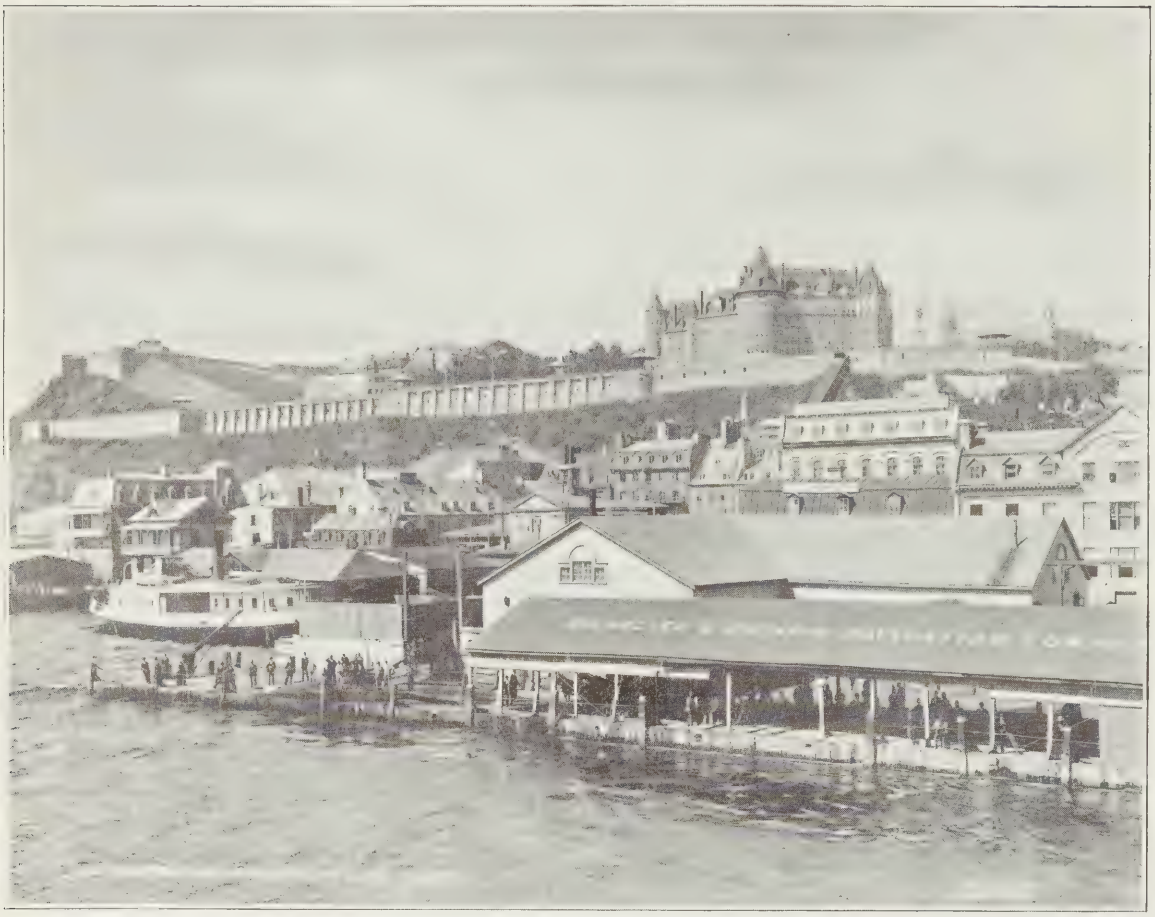
French Canada. After passing the village we enter the Coteau rapids. The channel through this group of rapids is very tortuous, winding in and out amongst the islands, and crossing from bank to bank. At times we almost brush the trees on shore, and the speed with which the steamer rushes past the land is an indication of the swiftness of the current.

Cedar Rapids.

Seven miles further on are Cedar rapids, considered by those familiar with the river to be the most beautiful of all the rapids. On the left, as we descend these rapids, is "Cedar island" and on the right "Hell's hole", the most turbulent spot in the river. A few minutes brings the steamer to Split Rock rapids, really the most difficult to navigate of them all, immediately after which comes the Cascade rapids, with their white crests. The fall of these last four rapids is eighty-four feet in eleven miles. The Soulanges canal parallels the river on the north side from Coteau to Cascade point, and is a most interesting sight, being massively built of stone, operated and lighted by electricity. The river for the next twelve miles widens out, and is called lake St. Louis, at the east end of which, on the north side, is the town of Lachine and opposite is the village of the Caughnawaga indians. We

Cascade Rapids.

Richelieu and Ontario Navigation Company—Montreal harbour, showing company's steamers in the foreground.



Richelieu and Ontario Navigation Company—Quebec.

soon pass under the Lachine railway bridge, and shortly afterwards are dashing through the Lachine rapids, the last of the chain, with a fall of forty-five feet. The channel through the Lachine rapids is narrow and tortuous, until the river broadens and calms itself, as it sweeps under the Victoria bridge to Montreal.

Lachine Rapids.

The steamer here transfers passengers to the company's steamers for Quebec and the Saguenay, and we advise those who intend visiting Quebec and the Saguenay to make this transfer now, and continue their journey, stopping over at Montreal on their return.

Montreal, Que., the commercial metropolis of Canada, founded in 1642, is named from Mount Royal, the mountain behind the city. The first church, Notre Dame de Bonsecours, was built in 1657. A visit to the Chateau de Ramezay, the church of Notre Dame, St. James cathedral (on the plan of St. Peters at Rome) Mount Royal park, and other places, will be found interesting. Historic spots in the older portions of the city are marked by marble tablets. Montreal is the headquarters for ocean shipping, and is the principal financial and business centre of Canada, and one of the wealthiest cities of its size in America. Its universities, hospitals, and public buildings are beautiful architecturally, and the entire city has the appearance of wealth and solidity.

Montreal.

The company's steamers between Montreal

and Quebec are very fine and large, with double tiers of staterooms. They leave Montreal at 7.00 p.m. Dinner is served after leaving. The cool breezes of the river, the tranquil scenery, as Longueuil, Boucherville, Varennes and Vercheres are passed in rapid succession, makes this portion of the trip very enjoyable.

Quebec.

Quebec is the principal military station in Canada, and, next to Gibraltar, the strongest fortified position in British territory. A walled fortification, with gates, surrounds the old city; the fortifications and best residence portion, or "Upper Town" are on the high land, and the business part and the older portion of the city are at the base of the cliff, on the St. Lawrence, around the point and along the bank of the St. Charles. The citadel is on the highest point, facing the St. Lawrence, 340 feet above the river, and a wall from the citadel runs along the top of the promontory to a point near the roadway, between upper and lower town. Inside of this is the famous public promenade known as Dufferin terrace, and at the east end of this terrace is the splendid hotel the "Chateau Frontenac", unique in character and design and a noble adjunct even to so grand a spot. In all its phases, in the approach by the river from the west; in the departure going east; from the citadel, the terrace or from the Chateau; looking down on the houses and ships and water beneath, and across to Levis, and out on the winding river toward the sea; in the narrow, precipitous stairs and streets and queer old crannies built against the cliff; in its history and people; its old-time

Richelieu and Ontario Navigation Company—Tadoussac Hotel, Tadoussac.

Richelieu and Ontario Navigation Company—Steamer nearing wharf at Murray Bay.

Richelieu and Ontario Navigation Company—Hotel "Manoir Richelieu," Murray Bay.

Richelieu and Ontario Navigation Company—Part of the fleet.

battlements, wall and gates—there is nothing like quaint old Quebec in the old world or new. The visitor to Quebec should visit the falls of Montmorency, seven miles east of the city, also the famous shrine of Ste. Anne de Beaupre, (twenty miles east, reached by electric railway) where over 150,000 pilgrims annually offer their devotions.

Saguenay River.

Those who intend visiting the Saguenay should take the Saguenay steamer, immediately on arrival at Quebec, and stop over at Quebec on the return; this will save time and transfer. The Saguenay steamers leave at 8.00 a.m.

Tadoussac.

After passing the southern shore of the isle of Orleans, the steamer follows the north shore of the river to Tadoussac. The scenery is majestic and beautiful beyond description; the mountainous capes and bold banks of the river are covered with pine, spruce and cedar, delighting the eye with every shade and blend of green, and impregnating the salt air with their wholesome fragrance. All along this route are scenes of beauty and grandeur, which are missed by the tourist unless the round trip is made by steamer from Quebec.

Murray Bay.

Murray Bay, the most popular watering place on the lower St. Lawrence, where the Richelieu and Ontario Navigation Company operates its splendid "Manoir Richelieu" one of the largest and best equipped summer hotels in Canada. Golf, fishing, sailing, and all the popular amusements may be enjoyed and the drives are numerous and charming. Murray Bay is especially noted for its bracing and health restoring atmosphere, the climate being a combination of mountain and sea air.

Richelieu and Ontario Navigation Company—Trinity rock, Saguenay river.

Chicoutimi.

Chicoutimi, is the head of navigation on the Saguenay. The Chicoutimi river here joins the Saguenay. From lake Kenogami, seventeen miles from Chicoutimi, this river falls 486 feet.

Capes Trinity and Eternity, about midway between Chicoutimi and Tadoussac on the south side, and about 2,000 feet in height, and face one another with a small bay between. Trinity is the more western of the two, and, while one mountain, it has three elevations, as seen from the Saguenay, hence its name. Its east side, on the little bay, is bare, perpendicular rock, and as you gaze up its unbroken steep, it appears as if it might fall over and crush the steamer.

For the information of tourists and sightseers who desire to see something of the St. Lawrence and Saguenay rivers we give hereunder schedule of principal fares.

Tickets and information may be obtained at all the important ticket offices in the various cities.

The fares in question are exclusive of meals and berths, the cost of which are as follows:—

MEALS—Breakfast 75 cents, Luncheon and Dinner $1.00.
STATEROOMS—

Between	Toronto and Prescott	Inside	$2.00,	outside	$3.00.
"	" (Berth)	"	1.00,	"	1.50.
				and	2.00.
"	Montreal and Quebec	Inside,	2.00,	outside,	2.50.
"	" (Berths).	"	1.00	"	1.50.
"	Quebec and Saguenay	Inside,	5.00,	outside,	6.00.
"	" (Berths).	"	2.50	"	3.00.

FARES BETWEEN PRINCIPAL POINTS.

From	To	One Way.	Round Trip.
		$ cts.	$ cts
Niagara Falls, N.Y.	1,000 Islands	6 50	11 75
"	Montreal, P.Q.	10 65	17 60
"	Quebec, P.Q.	15 55	24 95
"	Murray Bay, P.Q.		27 75
"	Tadoussac, P.Q.		29 60
"	Saguenay River		32 60
Toronto, Ont.	1,000 Islands	5 60	10 00
"	Montreal, P.Q.	10 00	16 70
"	Quebec, P.Q.	14 90	22 35
"	Murray Bay, P.Q.		25 25
"	Tadoussac, P.Q.		27 00
"	Saguenay River		30 00
Montreal, Que.	Quebec, P.Q.	4 90	7 35
"	Murray Bay, P.Q.		10 25
"	Tadoussac, P.Q.		12 00
"	Saguenay River		15 00
Quebec, Que.	Murray Bay, P.Q.		4 70
"	Tadoussac, P.Q.		6 50
"	Saguenay River		8 00

DOMINION ATLANTIC RAILWAY STEAMSHIP LINES.

BOSTON AND YARMOUTH.

Commencing Sunday, June 9th, steamers "Prince George" and "Prince Arthur" leave Long wharf, Boston, for Yarmouth, N.S. direct, Sundays, Tuesdays, Thursdays and Fridays at 2.00 p.m.

Dominion Atlantic Ry. S. S. Co.—Sandy cove, St. Mary's bay.

Dominion Atlantic Ry. S. S. Co.—Annapolis basin, as seen from the hill back of Digby.

Dominion Atlantic S. S. liner "Prince George."

Returning leave Yarmouth on arrival express train from Halifax (about 5.00 p.m.), Mondays, Wednesdays, Fridays and Saturdays.

On June 23rd, leave Boston daily, except Saturdays, for Yarmouth at 2.00 p.m.

Returning leave Yarmouth daily, except Sundays, on arrival of express train from Halifax.

BOSTON AND DIGBY.

Effective Friday, June 28th, direct service will be operated, Boston to Digby, N.S. The S.S. "Boston" leaving Long wharf, Atlantic ave., Boston, at 12.00 o'clock noon on Tuesdays and Fridays; returning leave Digby Wednesday and Saturday after arrival express train from Halifax. Close connection is made at Digby with all trains east and west to points in Maritime provinces.

Staterooms $2.00 upwards; meals, supper 75 cents, breakfast 50 cents.

Fare from Boston.	One way.	Round trip.
Yarmouth	$5 00	$9 00
Digby	7 00	11 95
St. John (via Digby)	7 75	13 00
Halifax	9 50	16 00

ST. JOHN AND DIGBY.

Steamer leaves St. John daily, except Sunday, 7.45 a.m., arriving Digby 10.45 a.m.

Returning leave Digby daily, except Sunday, 2.00 p.m., arriving St. John about 5.00 p.m.

Fare, one way $1.75; $3.00 round trip.

Rates to all points in the provinces quoted on application.

KINGSPORT-PARRSBORO-WOLFVILLE.

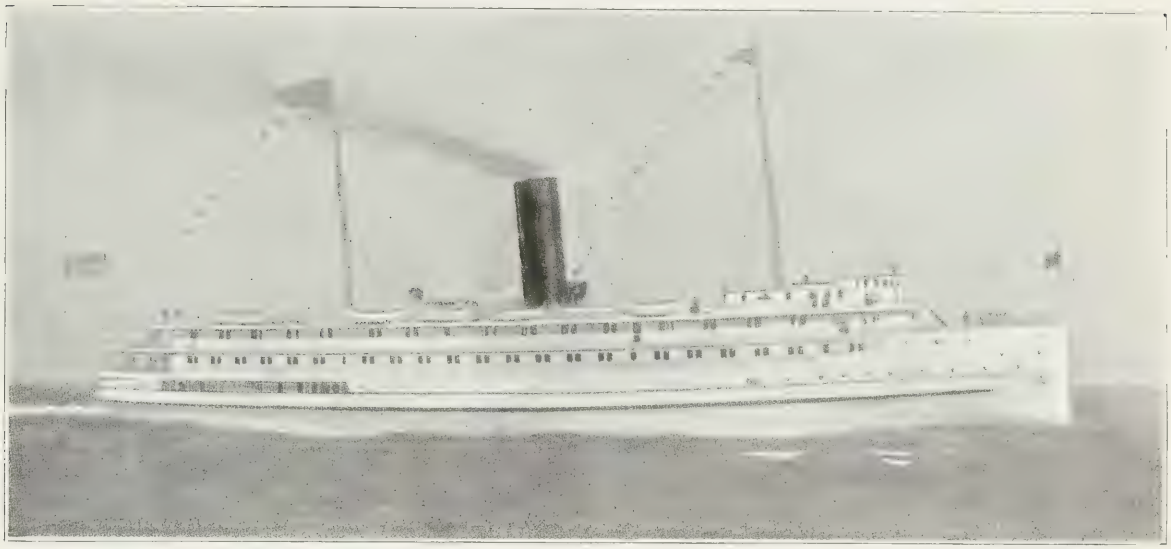
A daily service (Sunday excepted) is performed on Minas basin between the above three points from May 1st to December 30th. Schedule dependent upon tidal conditions—connects at Kingsport and Wolfville with trains east and west.

THE CHARLOTTETOWN STEAM NAVIGATION COMPANY, LIMITED.

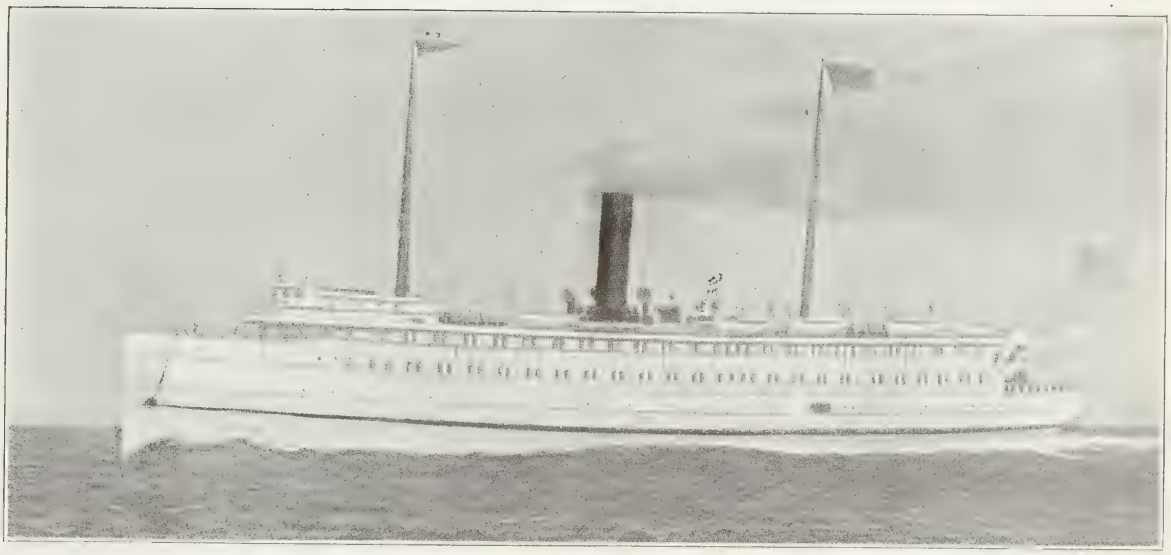
The service operated by this company is between Charlottetown, Prince Edward Island, and Pictou, Nova Scotia, and between Summerside, Prince Edward Island and Pointe du Chene, New Brunswick, both daily, except Sunday, during open navigation.

The distance between Charlottetown and Pictou is 52 miles and the fare is $2.00, return $3.00. The distance between Summerside and Pointe du Chene is 41 miles and the fare is $1.50, return $2.25.

The Charlottetown Steam Navigation Company—Steamer "Empress," 1,242 tons.



Eastern Steamship Company—S. S. "Governor Cobb."
A similar steamboat but larger runs between Boston and St. John.



Eastern Steamship Company—S. S. "Governor Dingley."
This line runs a steamer between St. John and Boston.

A PICKFORD & BLACK STEAMER AT BARBADOES

PICKFORD AND BLACK LINES.

The steamers of this company are well equipped for southern waters. They carry saloon and deck passengers when sailing from one island to another in the Windward Islands. One route is from St. John, N.B. and Halifax, N.S. to Demarara via Bermuda, St. Kitts, Antigua, St. Lucia, St. Vincent, Barbadoes and Trinidad and they are advertised to sail every eleven days from the two Canadian ports mentioned. The company has also a Jamaica service. The published rates are:—

	Single	Return
First class to Bermuda	$25.00	$ 40.00
Second class to Bermuda	20.00	35.00
First class to St Kitts, Antigua, St Lucia, St Vincent, Barbadoes	40.00	70.00
First class to Trinidad	50.00	90.00
Second class to Trinidad	40.00	70.00
First class to Demarara	65.00	110.00
Second class to Demarara	50.00	80.00

No responsibility is taken in connection with any rates published in this book.

THE QUEBEC STEAMSHIP COMPANY LIMITED.

The Quebec Steamship Company, Limited, maintains two services on the St. Lawrence, one

Quebec S. S. Co.—S. S. Bermudian at the dock, Hamilton, Bermuda.

Quebec S. S. Co.—S. S. Bermudian—Promenade deck.

between Montreal and Pictou, N.S. (for Halifax) and the other between New York and Quebec via Long Island sound, Halifax, N.S., the strait of Canso, Charlottetown, P.E. Island, the Gulf and Lower St. Lawrence. The commodious iron steamer Cascapedia is on the first route; the second is operated by the fast mail steamer Trinidad.

No responsibility is taken for rates of any kind published in this book.

Montreal to	Rates of Cabin Passage including Meals Berth Extra		Berth Fare each way	Deck Passage only
	One way	Return		
Quebec	$ 3.50	$ 6.65	$ 1.00	$ 1.00
Gaspe	13.50	25.65	3.50	4.00
Mal Bay	14.50	27.55	3.50	5.00
Perce	15.50	29.45	3.50	5.00
Grand River	16.00	30.40	3.50	5.00
Summerside, P.E.I	20.50	38.95	4.50	8.00
Charlottetown, P.E.I	22.50	42.75	5.00	8.50
Pictou, N.S.	24.50	46.55	5.50	9.00
St. John, N.B. via Pointe du Chene	25.25	46.10	4.50	.....
Halifax, N.S. via Pictou	28.05	51.90	5.50	.....

Quebec to	Rates of Cabin Passage including Meals Berth Extra		Berth Fare each way	Deck Passage only
	One way	Return		
Gaspe	$11.00	$20.90	$ 2.50	$3.00
Mal Bay	12.00	22.80	2.50	4.00
Perce	12.75	24.75	2.50	4.00
Grand River	13.50	25.65	2.50	4.00
Summerside, P.E.I	18.50	35.15	3.50	7.00
Charlottetown, P.E.I	20.50	38.95	4.00	7.50
Pictou, N.S.	22.50	42.75	4.50	8.00
St. John N.B. via Pointe du Chene	23.25	42.30	3.50	.....
Halifax N.S. via Pictou	26.05	48.10	4.50	.....

The rates between Quebec and New York and vice versa per berth according to state room, one way $45.50 and $55. The company maintains steamships of the highest class on the route from New York to the Windward islands.

OCEAN-GOING LINES SAILING BETWEEN CANADA ATLANTIC COAST AND EUROPEAN PORTS AND RATES BY EACH STEAMER.

	Tonnage	1st Cabin	2nd Cabin
Allan Line—			
Montreal to Liverpool S S Tunisian	10,576	$80.00	50.00
" Glasgow S S Ionian	8,286	.....	47.50
			1 rate
" London via Havre S S Sicilian	7,341	.....	45.00
" Liverpool S S Virginian	10,754	90.00	52.50
" Glasgow S S Hesperian	10,000	70.00	50.00
" Glasgow Parisian	5,395	.....	45.00
" Glasgow Grampian	10,000	70.00	50.00
" London, via Havre, Lake Erie	7,555	.....	45.00
" Liverpool, Corsican	11,436	80.00	50.00
" Glasgow, Scotian	10,490	.....	47.50
" London, Sardinian	4,349	.....	45.00
" Liverpool, Victorian	10,629	90.00	52.50
Canadian Pacific—			
St John to Liverpool, S S Empress of Britain	14,500	85.00	53.75
" " Lake Champlain	7,400	.....	50.00
			1 rate.
(same rate from Montreal)			
" " Empress of Ireland	14,500	85.00	53.75
" " Lake Manitoba (after 1st May 1st cabin is $92.50)	10,000	.....	50.00
Quebec to Liverpool Empress of Ireland	14,500	92.50	53.75
Montreal to Liverpool, Lake Manitoba	10,000	.....	50.00
Canadian Northern—			
Montreal to Bristol, Royal George	12,000	92.50	53 75
" " Royal Edward	12,000	92.50	53 75
White Star Dominion—			
Montreal to Liverpool, S S Canada	..	.. .	50.00
			1 class
" " Megantic	14,878	92.50	53.75
" " Laurentic	14,878		
" "			
" " S S Teutonic	9,984	.....	55.00
Cunard—			
			1 rate
Montreal to London, S S Ultonia	10,000	.....	47.50
" " S S Ascania	10,000	.....	47.50
Donaldson—			
St. John to Glasgow, S S Saturnia	9,000	one cabin	47.50
" " S S Cassandra	9,000	"	"
Montreal to Glasgow, Saturnia	9,000	"	"
" " Athenia	10,000	"	47.50
" " S S Letitia	10,000	.....	47.50

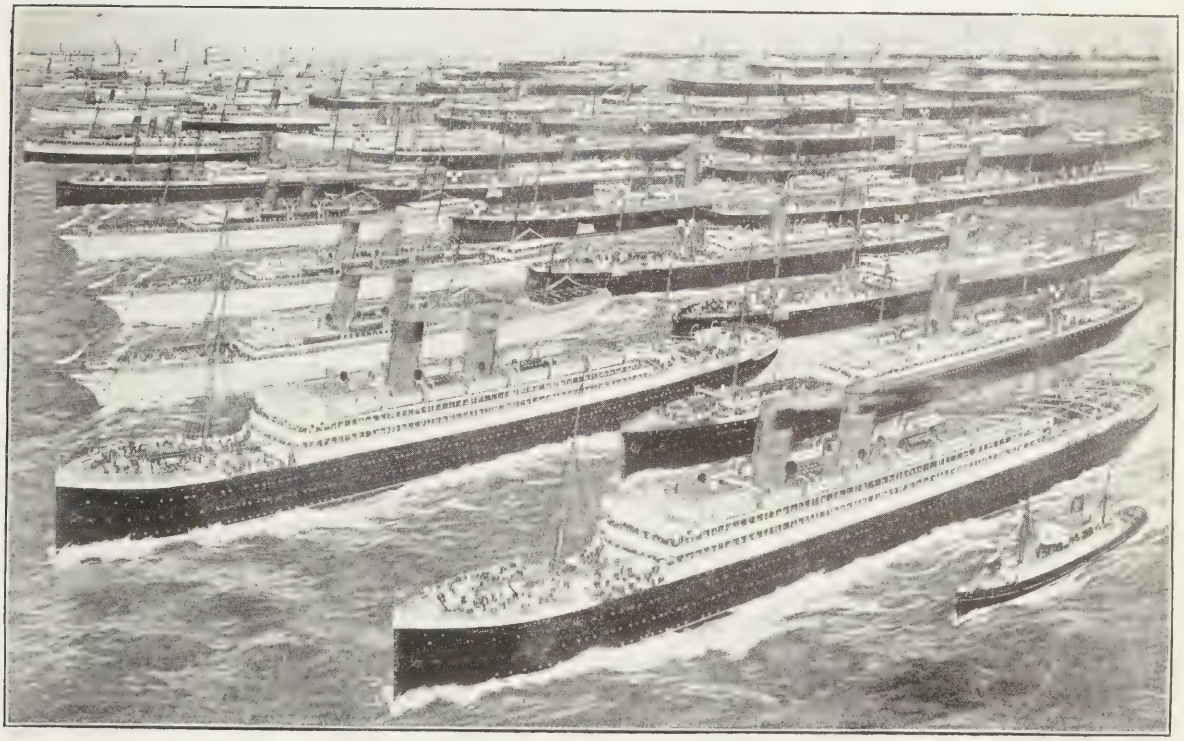
Other ocean-going lines sailing between Canada and European ports from the Atlantic coast are the Manchester, British and North Atlantic, Cairn, Elder Dempster, Leyland, Reford, Furness-Withy lines and Thompson lines, besides steamboat lines making irregular voyages.

Allan Line—Steamship "Parisian."

Steamship "Scotia"—Inward bound, going 18 knots. Snapshot from deck of "Gulnare," going 10 miles the other way.

Allan Line—One class cabin—S. S. Ionian.

Allan Line—Dining saloon S. S. Hesperian or S. S. Grampian.



Canadian Pacific Railway Company—The fleet of steamers in commission.

Canadian Northern Railway steamship service—Steamship "Royal Edward."

The Pacific lines are the Canadian-Australian Royal Mail line running between Vancouver, Victoria and Auckland, New Zealand, Sydney, Australia and Suva Fiji. The Canadian Pacific Railway Company's Royal Mail line, between Vancouver, Victoria, Seattle and Honolulu, Hong Kong, Kobe, Moji, Nagasaki, Shanghai and Yokohama. The Mexican Pacific S.S. Company from Vancouver and Victoria to Mexico. The Pacific Coast S.S. Company from Victoria to San Francisco, Cal.

STEAMSHIP LINES OF THE MARITIME PROVINCES.

(From Steamboat Inspection Report).

Charlottetown, P. E. Island, Steam Navigation Co's. ships sail between Pictou, N.S. and Charlottetown, P.E.I. and between Summerside, P.E.I. and Pointe-du-Chene, N.B., during the season of navigation which is usually from the 15th of April to the 15th of December.

Cann & Sons' Steamship lines run between Yarmouth, N.S. and Port Clyde, Mulgrave and Canso, N.S. Mulgrave and Guysborough, N.S., Mulgrave and Cheticamp, N.S.

Cape Island Steamboat line, runs between Yarmouth and Port Clyde, N.S.

Coastal Steam Packet Co.'s line runs between Halifax and Bridgewater, N.S.

Canada Atlantic and Plant Steamship lines run between Boston, Mass., and Halifax, N.S., Boston, Mass., and Charlottetown.

Dominion Atlantic Railway Steamship Co's. ships ply between Yarmouth, N.S., and Boston, Mass; St. John, N.B., and Digby, N.S., Yarmouth, N.S., and New York, U.S.A., Kingsport and Parrsboro, N.S.

Halifax and Canso, S.S. Co's. boats ply between Halifax, Canso and Guysborough, N.S., between Pictou and Mabou, N.S.

The Insular Steam Packet Co's. boats ply between Yarmouth, N.S., Westport, N.S. and St. John, N.B.

Merchants Line boats ply between Montreal, P.Q., and Toledo, Ohio, U.S.A.

Miramichi Steam Navigation Co's. steamboats ply between Chatham, N.B., Nelson, N.B. and Neguac, N.B.

Magdalen Islands Steam Ship Co.'s steamers ply between the Magdalen Islands and Pictou, N.S., between Pictou, N.S. and Pleasant Bay, N.S.

North American Transportation Co.'s steamboats ply between Dalhousie and all Bay des Chaleurs and Gaspe, P.Q. ports; between Murray Bay and Riviere Ouelle, P.Q.

Pickford and Black lines sail between Halifax, N.S., and Summerside, P.E.I., and between Halifax and Aspey bay, N.S.

Red Cross Line steamers ply between Halifax, N.S., St. John's, N.F. and New York.

Sherbrooke Packet Line steamers ply between Sherbrooke, N.S. and New York.

South Shore Line's steamboats ply between St. John, N.B., and Yarmouth, N.S.

LOWER ST. LAWRENCE RIVER.

Dobell's Line between Montreal, Sydney, N.S. and St. Johns, N.F.

Quebec SS. Company's steamers ply between Montreal, Quebec and Pictou, N.S.

Richelieu and Ontario Navigation Company's line steamers ply between Montreal, Toronto and Charlotte, N.Y.; between Montreal and Chambly, P.Q.; between Montreal and Contrecoeur and de L'Isle, Que.; between Quebec and Montreal; between Montreal and Three Rivers, P.Q.; between Quebec and Chicoutimi; between Sorel and Ste. Anne; between Montreal and Hamilton.

River St. Maurice Line between Grandes Piles and La Tuque.

Three Rivers SS. Company's boats ply between Three Rivers and Pictou, N.S., Georgetown, P.E.I., and Charlottetown, P.E.I.

Ontario and Quebec Navigation Co.'s boats ply between Quebec and Olcott Beach, N.Y.

OTTAWA RIVER LINES.

Ottawa River Navigation Company's boats ply between Ottawa, Ont. and Montreal, P.Q.

Lumsden Line steamers ply between New Liskeard and Haileybury, Ville Marie and Temiskaming, lake Temiskaming.

LAKE ONTARIO LINES.

St. Lawrence River Steamboat Company's boats ply between Kingston and Cape Vincent; between Kingston and Wolf Island.

Lake Ontario Navigation Co.'s boats ply between Toronto and Alexandria Bay, N.Y.

Lake Ontario and Bay of Quinte Steamboat Company's steamboats ply between Charlotte, N.Y., and Thousand Islands, via the Bay of Quinte and to Port Hope and Cobourg, Ont.

Calcutt Line sails between Peterborough, Ont. and Birdsalls, Ont.

Deseronto Navigation Co.'s boats ply between Trenton and Picton; between Deseronto and Picton; between Deseronto, Ont., and Oswego, N.Y.; between Gananoque and Clayton, N.Y.

Trent Valley Navigation Company's steamers ply between Coboconk and Lindsay, Ont.; Lindsay and Bobcaygeon, Burleigh Falls and Lakefield.

Niagara Navigation Company's boats ply between Toronto and Queenston, Ont., and Lewiston, N.Y.

Niagara, St. Catharines and Toronto Navigation Company's boats ply between Toronto and Port Dalhousie, Ont.

Hamilton Steamboat Co.'s boats ply between Toronto and Hamilton, Ont.

LAKE ERIE LINES.

Marquette and Bessemer Dock and Navigation Co.'s boats ply between Conneaut harbour, Ohio, U.S.A., and Port Stanley, Ont.

Cleveland and Georgian Bay Line runs between Cleveland, Ohio, and Sault Ste Marie, Ont.

LAKE SIMCOE.

Lake Simcoe steamers ply from Orillia, Barrie and Jackson's Point, Ont.

LAKE HURON, GEORGIAN BAY AND LAKE SUPERIOR.

Algoma Central SS. Line steamers run from Sault Ste. Marie, Ont., to Toledo, Ohio, and Owen Sound, Ont., during the season of navigation which is generally from the 15th of April to the 15th December.

Northern Navigation Co. of Ontario boats ply from Collingwood via Owen Sound to Sault Ste. Marie, Ont., between Penetanguishene and Parry Sound; between Sarnia and Duluth, Minn.; between Collingwood and Killarney via Parry Sound.

Canadian Pacific upper lakes steamship line runs between Owen Sound and Port Arthur and Fort William, Ont.

White Line Transportation Company's boats ply between Duluth and Port Arthur.

BRITISH COLUMBIA COAST WATERS.

Canadian Pacific Railway British Columbia coast lines ply between Victoria, B.C., and Cape Scott, B.C., between Vancouver and Skagway, Alaska; between New Westminster, B.C., and Chilliwack, B.C.; between Victoria, B.C., and Naas River, B.C.; between Victoria and New Westminster; Vancouver and Nanaimo; Nanaimo and Comox.

Grand Trunk Pacific "Prince George," "Prince Albert" to Prince Rupert and northern points.

Union Steamship Company's steamers ply between Vancouver and Naas, B.C., and along the coast from Vancouver, B.C.

Alaska SS. Co. steamers sail between Seattle, Wash., and Victoria, B.C.

Northern Steamship Co. "Cetriana" and "British Empire" to all northern points.

New Westminster and Chilliwack steamer route is between New Westminster and Chilliwack.

Sidney and Nanaimo Steamship Company's ships ply between Sidney and Nanaimo; Sidney and Saturnia, B.C.

Victoria Terminal Railway and Ferry Company's boats ply between Sidney, B.C., and Cloverdale, B.C.

Western Steam Navigation Company's boats ply between Vancouver, B.C., Seattle and Tacoma, Wash.

Terminal Steam Navigation Co.'s boats ply between Vancouver, Howe sound route.

BRITISH COLUMBIA INLAND WATERS.

Canadian Pacific Railway British Columbia lakes and rivers lines run between Arrowhead, and Robson; between Rosebery and Slocan City; between Nelson and Kaslo; between Kaslo and Lardo; between Nelson and Kootenay Landing; between Gerrard and Trout Lake City, Okamaga and Kenticon.

International Navigation and Trading Co., ply between Nelson and Kaslo.

Upper Columbia Navigation Company's boats between Golden and Windermere, B.C.

GENERAL.

The above list of steamboat lines does not include the vast number of excursion, passenger and freight steamers owned by individual owners, running on the coast and inland waters.

EXPERIMENTAL FARMS AND AGRICULTURAL COLLEGES.

The agricultural institutions of the country are now affording excellent facilities for gaining a knowledge of scientific farming and manual training. Experimental farms have been established in several provinces of the Dominion, and the country is beginning to reap much benefit from the experiments in producing hardier and more prolific kinds of cereals, vegetables and more perfect and finer kinds of fruits. Success has already followed these efforts in all lines. Nurseries for forest, ornamental, shade and fruit trees have been for many years contributing their quota to the various farming sections of Canada.

Seed grain, vegetable seed, roots and tubers have been distributed among farmers free of charge from the government experimental farms.

The breeding of horses, cattle, sheep, swine and poultry and dairying experiments have received, at these farms, the most careful attention, and many private stock farms have rivalled the public institutions in the same field.

The experimental farm near Ottawa is the chief Government experimental farm and two institutions have all the equipment, land area and accompaniments of the experimental farms with the additional advantages of agricultural and training colleges. These colleges deserve a most prominent place in any production relating to the development of Canada. No better description can be given of the two establishments than a few extracts from the publications of the colleges or institutions.

THE ONTARIO AGRICULTURAL COLLEGE, GUELPH, ONT., CANADA.

The college is beautifully situated on an elevation directly south-east of the city of Guelph in the county of Wellington. The location (1,138 feet above sea level) is in the midst of pleasant scenery and healthful surroundings for which this part of the province is widely known. Pure air, artesian water, and a moderate climate, render the institution a most desirable place for residence. Being a mile and a half from the city of Guelph the college is remarkably free from those things which at many colleges are wont to distract the attention of students and to dissipate their energies.

Guelph may be reached by either the Grand Trunk or Canadian Pacific railways, and electric cars run between the college and the city at 20-minute intervals, each day except Sunday.

Communication is made easy by the long distance telephone, by telegraph or by the postal system, there being two mails a day to and from the college.

Established in 1874 the institution had two main objects: First, to train young men in the science and art of improved husbandry; and second, to conduct experiments and publish the results.

Guelph, Ont.—Ontario Agricultural College—Men's residence.

Ladies' residence—Ontario Agricultural College, Guelph.

MASSEY HALL AND LIBRARY.

The Massey hall and library is an abiding expression of the generosity of the late Mr. Hart Massey. In 1901, his heirs, represented by the late W. H. Massey and Mr. Chester Massey, built and presented to the college this noble structure. It is a handsome red brick building reared on a foundation of Medina sandstone. The Massey hall occupies the ground floor. This is semi-circular in shape and provides seating accommodation for about four hundred and fifty people. It is used for roll call, Sunday chapel service, literary society meetings, concerts, etc. Overhead is the library, consisting of a reference library, a lending library, and two magazine rooms. Accommodation is provided for eighty thousand volumes. The reading room is most adequately fitted up with tables and individual electric lights. Both author and subject card catalogs are in use, and over sixteen thousand volumes are within easy access of the student. The library is highly prized by the student body.

Massey Hall and Library—Ontario Agricultural College, Guelph.

Macdonald Institute, Ontario Agricultural College, Guelph.

Macdonald Agricultural College, St. Anne de Bellevue, P.Q.—Main building.

MACDONALD HALL, GUELPH COLLEGE.

G. C. Creelman, B.S.A., LL.D., President.
S. Springer - - - Bursar.
Mrs. K. T. Fuller - - Supt.
Miss Ethel Tennant - - Housekeeper.

Macdonald hall is on the north side of the campus, on the highest point of the College Heights and is especially designed for the comfort and well-being of the women students of Macdonald Institute. The ground floor contains wide corridors, attractive reception and dining rooms, offices, lavatories, and a few bedrooms; the first floor a gymnasium, students' sitting room, lavatories, and bedrooms; and the second floor, lavatories and bedrooms only. There are 35 single rooms and 40 double rooms, all of them well lighted and cheery; 116 students can be accommodated, in addition to the members of the working staff, who are equally well provided for. The Superintendent will control the students in residence, will direct the social life, and will do her utmost to make the hall a real home.

MACDONALD COLLEGE.

Macdonald college, which is incorporated with McGill University, was founded, erected, equipped, and endowed by Sir William C. Macdonald for the following among other purposes:—

1. For the advancement of education; for the carrying on of research work and investigation and the dissemination of knowledge; all with particular regard to the interests and needs of the population in rural districts.

2. To provide suitable and effective training for teachers, and especially for those whose work will directly affect the education in rural districts.

Recognizing the importance of adequate education, adapted to the needs of the rural communities which are the great producing classes of the country, this college will labor in sympathy with all educational effort which makes for the development and increase of intelligence, of power, ability, and skill, and of willingness to co-operate for the common good in each locality as well as in the nation at large. Therein lies the reason for arranging the work of the college, into a School for Teachers, a School of Agriculture, and a School of Household Science. Increase of productiveness, with improvement of products in the field and in the industries of the farm and the town, greater comfort and enjoyment in the home, a better taught school for the children, and a nobler sense of the responsibilities of life—these are some of the advantages which Macdonald college hopes to assist in providing for Canada.

The college occupies a beautiful site, overlooking the Ottawa river at Ste. Anne de Bellevue, Que., twenty miles west of Montreal. The main lines of the Grand Trunk and the Canadian Pacific railways pass through the property, and the stations of both railways are within its boundaries.

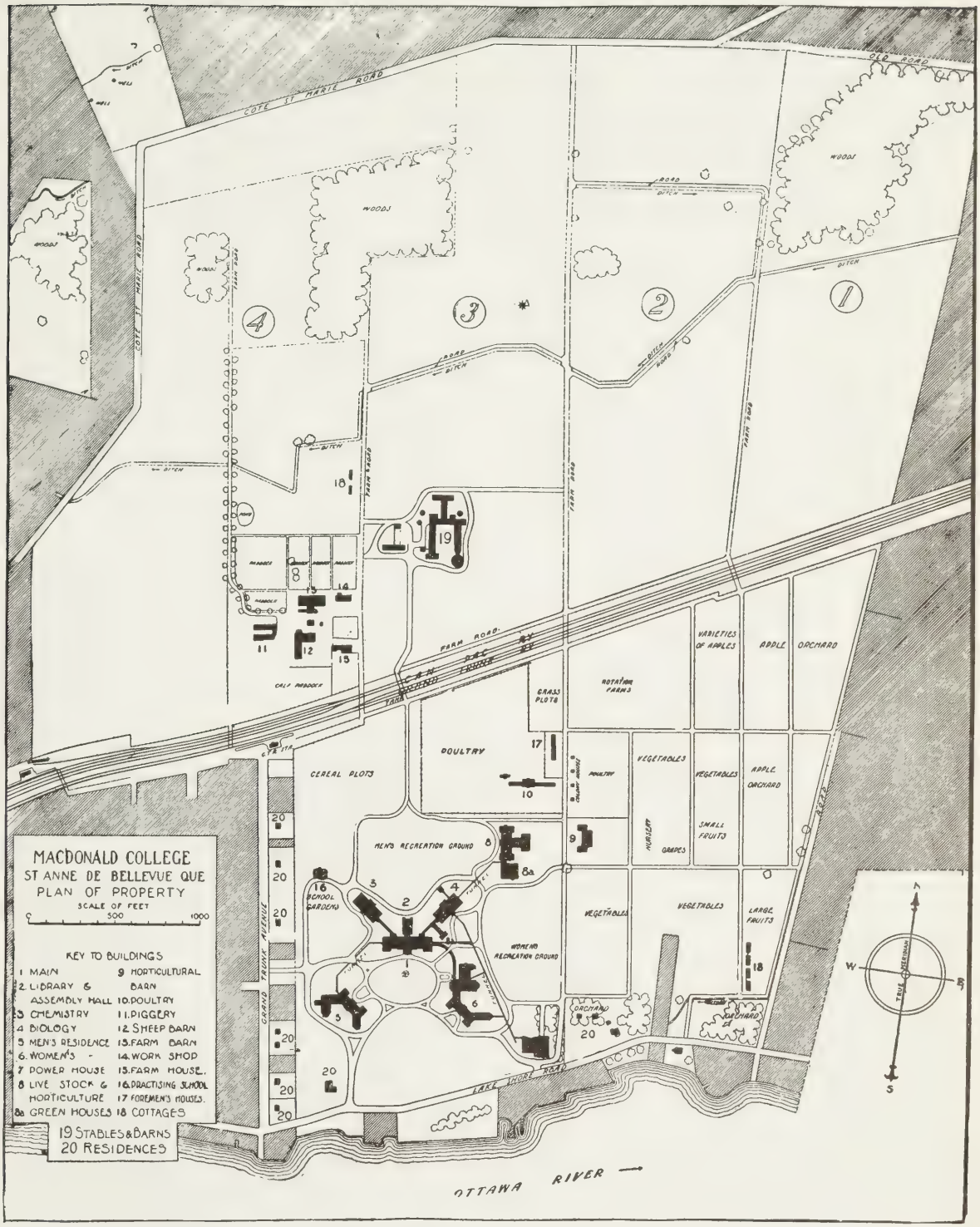
THE MATERIAL EQUIPMENT.

THE BUILDINGS ON THE CAMPUS.

The buildings on the campus are of fire-proof construction. The walls are of brick and cement; the beams and rafters are of steel, and the partition walls of the rooms are of terra cotta. The roofs are of reinforced concrete, and are covered with tiles. The red tiles of the roof harmonize well with the flash brick of the exterior walls. The arrangement of the buildings allows of spacious courts in front, sides, and rear, so that every room has abundance of light.

Every building is provided with a complete system of ventilation, whereby fresh air (warmed in winter) is furnished to every room. A duct from each room removes the inside air, and thus insures a continuous circulation of pure air from outside.

The buildings are heated with steam, lighted by electricity, and supplied with water from the college power house. A system of tunnels provides for the distribution of heat, light, power, water, and gas. The power house contains six horizontal tubular boilers of 150 h.p. each, with engines, electric generators, pumps, and a gas plant. The water supply is taken from the Ottawa river; and drinking water is obtained from a rock-drilled well.


MACDONALD COLLEGE
ST ANNE DE BELLEVUE QUE
PLAN OF PROPERTY
SCALE OF FEET
0 500 1000
KEY TO BUILDINGS
1 MAIN
2 LIBRARY & ASSEMBLY HALL
3 CHEMISTRY
4 BIOLOGY
5 MEN'S RESIDENCE
6 WOMEN'S -
7 POWER HOUSE
8 LIVE STOCK & HORTICULTURE
8a GREEN HOUSES
9 HORTICULTURAL BARN
10 POULTRY
11 PIGGERY
12 SHEEP BARN
13 FARM BARN
14 WORK SHOP
15 FARM HOUSE.
16 PRACTISING SCHOOL
17 FOREMEN'S HOUSES.
18 COTTAGES
19 STABLES & BARNS
20 RESIDENCES
COTE ST MARIE ROAD
OLD ROAD
WOODS
FARM ROAD
C.P.R.
CEREAL PLOTS
POULTRY
GRASS PLOTS
ROTATION FARMS
VARIETIES OF APPLES
APPLE ORCHARD
VEGETABLES
SMALL FRUITS
LARGE FRUITS
MEN'S RECREATION GROUND
WOMEN'S RECREATION GROUND
SCHOOL GARDENS
ORCHARD
LAKE SHORE ROAD
GRAND TRUNK R.R.
OTTAWA RIVER
TRUE MERIDIAN

HOTELS AND RATES.

Windsor, Montreal.

The Windsor hotel, Montreal, is one of the principal hotels of Canada and can accomodate a great many guests. The menu is of the most sumptuous kind in the country. The hotel is patronized largely by visitors from all parts of the world and is cosmopolitan in character. It is conducted on the European plan and the rates are from $2.00 per day up for single rooms; suites of rooms are available for guests who desire them and the rates or charges are made accordingly. The hotel is most centrally situated, facing on Dominion square and at a convenient distance from the Windsor and Bonaventure railway stations, the two principal stations in Montreal. It is also a short distance from Mount Royal.

C. P. R. Company's Hotels.

Chateau Frontenac, Quebec, occupies one of the finest hotel sites in the world. It is located on a promontory near the Citadel of Quebec overlooking the St. Lawrence river. The panoramic view of the river east and west, the Montmorency falls in the distance and the open country on the south side of the river forcibly impress the observer. The rates at this hotel are $4.00 per day and upwards, American plan. See illustration in connection with description of Canadian Pacific railway.

RATES AT C.P.R. HOTELS.

Place Viger, Montreal, $4.00 per day and up.

The Algonquin, St. Andrews, N.B., $3.50 per day and up, open June to Sept.

McAdam Junction Hotel, McAdam Jct., N.B., $3.00 per day and up.

Caledonia Springs Hotel, Caledonia Springs, Ont., special rates by week or month.

Royal Alexandra Hotel, Winnipeg, European plan.

Banff Springs Hotel, Banff, Alberta, $4.00 and up. Open, May 25th to Sept 30. See illustration in description of Canadian Pacific railway.

Chateau Lake Louise, Laggan, Alberta, $4.00 and up. Open, June 10th to Sept. 30.

Mount Stephen House.

This is a chalet hotel at Field Station, B.C., fifty miles west of Banff, at the base of Mount Stephen, which towers 8,000 feet above. It is a favorite place for tourists, mountain climbers and artists.The wonderful Yoho Valley is reached by way of Field. Rates, $3.50 per day and upward. American plan.

Emerald Lake Chalet

The Emerald Lake Chalet is situated near Field, B.C., and is open from June 15th to September 30th. It is a most romantically situated Swiss chalet hotel with accommodation for forty guests. The gateway to Yoho Valley, 7 miles from Field Station. Transfer charge $1.00. Rates, $3.50 per day and upward. American plan.

Glacier House Hotel.

This house, situated at Glacier, B.C., is open from May 1st to October 31st. It is in the heart of the Selkirks, within forty-five minutes walk of the Great Glacier, which covers an area of about thirty-eight square miles. Rates, $3.50 per day and upward. American plan.

Hotel Revelstoke.

The Hotel Revelstoke, at Revelstoke, B.C., is situated between the Selkirks and Gold Ranges, at the portal of the West Kootenay gold fields and the Arrow Lakes. Rates, $3.00 per day and upward. The hotel is conducted on the American plan.

Kootenay Lake Hotel.

A new first class tourist hotel at Balfour, B.C., and is now open for the season. Rates, $3.50 per day and upward. The hotel closes for the season on October 15.

Fraser Canon House.

This hotel is situated at North Bend, B.C. It has been lately renovated and refurnished. Situated on the Fraser River, and a splendid base to visit the wonders of that magnificent stream. Rates $3.50 per day and upward. American plan.

Hotel Sicamous. The Hotel Sicamous, at Sicamous, B.C., is built on the shores of the Shuswap lakes where the Okanagan branch of the C.P.R. begins. Rates, $3.50 per day and upward. American plan.

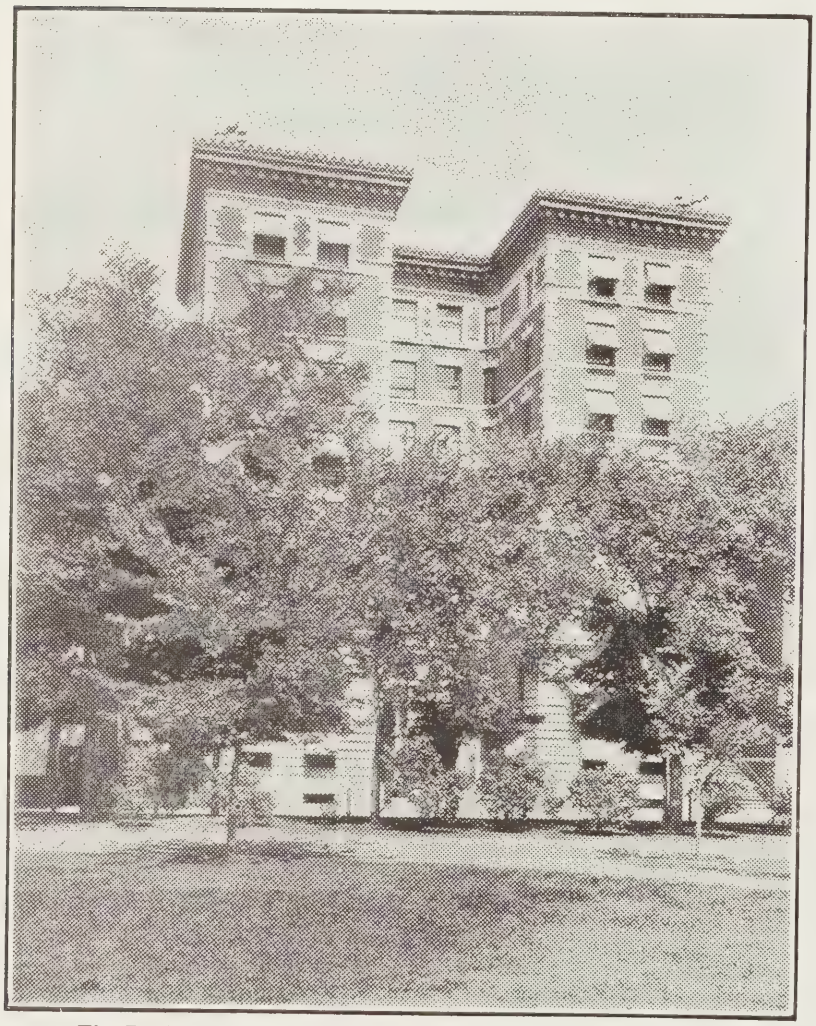
Hotel Vancouver. The Hotel Vancouver, at Vancouver, B.C., the Pacific Coast terminus of the Railway, is a hotel designed to serve the large commercial business of the city, as well as the tourists who find it profitable and interesting to remain a day or longer. Situated ½ mile from C.P.R. Station; transfer charge 25 cents. Rates, $4.00 per day and upward. American plan. See illustration in description of Canadian Pacific railway.

Empress Hotel. This magnificent hotel, only recently completed, is situated at Victoria, B.C., at a short distance from the boat landing. It is one of the most beautiful hotels on the American Continent. European plan. See illustration in description of Canadian Pacific railway.

King Edward Hotel Toronto. The King Edward Hotel, Toronto, is spacious and accommodates a large number of guests. It is of comparatively recent construction and ranks among the highest class hotels of the continent; its appointments and equipment are of the latest practice. This hotel is centrally located and within easy reach of all the most important marts of commerce, public parks, churches and public buildings. It is conducted on the European plan respecting meals, with cafes, dining room and grill room. The rates for rooms are $1.50 a day for single room, $2.50 for double rooms, and upwards according to the size and location of the room: with bath room $2.50, single rooms, $4.00 a day for double rooms and upwards according to size and location.

Toronto—King Edward Hotel.

Ottawa—The new Russell Hotel.



The Roxborough—A modern 8-story apartment house, Ottawa.

Toronto—Queen's Hotel.

Queens Hotel, Toronto. The Queens hotel, Toronto, has for many years been justly noted for its comfortable appointments, excellent menu and service. The hotel is most favourably situated for reaching the Union railway station, street cars and steamboats which ply on Lake Ontario in various directions. It is conducted both on the European and American plans. American plan—rooms without bath from $3.50 a day upwards each person; rooms with bath from $4.00 a day upwards each person. European plan—rooms without bath from $2.00 a day upwards each person; rooms with bath from $2.50 a day upwards.

Chateau Laurier, Ottawa. The Chateau Laurier is fully described in the description of the Grand Trunk Pacific railway and an excellent lithograph of the hotel will be seen in illustrations of the line. It is located on one corner of Major Hill park, a Government park, unique in its location adjoining the grounds of the Parliamentary buildings of Canada. The main entrance faces the Plaza now under construction.

The hotel is claimed by the proprietors to be the finest structure of the kind on the continent, costing $2,000,000. The new Grand Trunk station is immediately opposite. The rates are:—single room, $2.00 a day without private bath and $2.50 with bath; double rooms $3.50 a day without private bath and $4.00 with bath, all according to location of rooms. The hotel is conducted on the European plan and contains dining room, cafe, grill room and children's dining room.

The New Russell Hotel, Ottawa. The New Russell hotel is a first class hostelry with spacious rotunda and excellent cafe. From this hotel is a passage leading to the Russell theatre. This has long been the principal hotel of Ottawa and a centre for deputations and visitors who have business with the Government. It is near the new Grand Trunk Railway or Central station. The rates are:—European plan—$1.00 and $1.50 without bath, single; $2.50 and $3.50 without bath, double; $2.00 and $3.50 with bath, single; $4.00 and $5.00 with bath, double rooms.

Roxborough Apartments The Roxborough, an apartment house, is a new building on Laurier avenue, Ottawa, facing Cartier square. Visitors are accommodated in the summer season.

The Halifax Hotel. The Halifax hotel is one of the principal hotels in the Maritime Provinces and has excellent accommodation and service.

The Royal Hotel, St. John. The Royal hotel at St. John, N.B., has long been known as a favourite hostelry for visitors to the enterprising city of St. John.

Prince Arthur Hotel. The Prince Arthur hotel at Port Arthur, Ontario, is owned by the Canadian Northern railway company, and is most favourably situated within a stone's throw of the water front and railway station. The rates are $2.50 a day and upwards, according to location of room. The hotel is conducted on the European plan.

C.N.R.—Hotel "Prince Arthur" at Port Arthur Ont.

PROMISCUOUS ILLUSTRATIONS

Montreal Harbour Commission—Elevator No. 2 in course of construction.

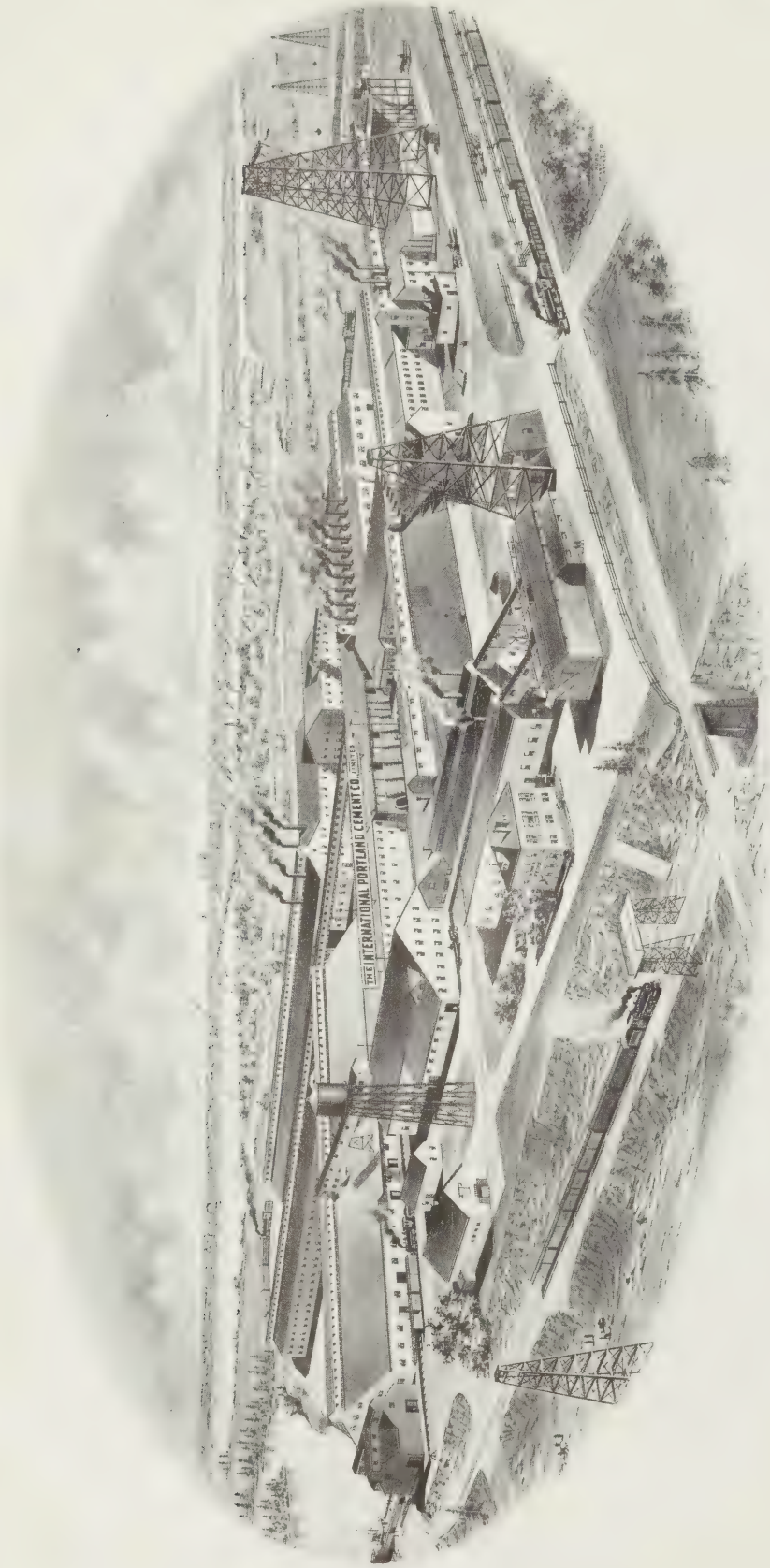
Montreal Harbour Commission—Concrete wall in front of elevator No. 2, Montreal.

Montreal Harbour Commissioners—Floating crane.

Vancouver, B.C.—A public building.

A detachment of the Royal Northwest Mounted Police;

20,000 bags of coal for shipment north—South Wellington, B.C.



International Portland Cement Company, Limited, Hull, P.Q.

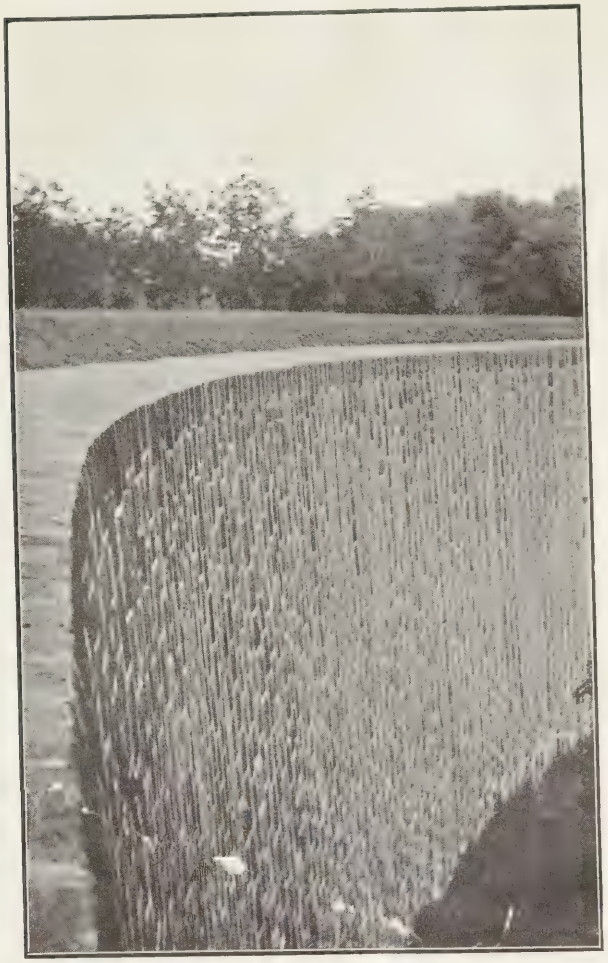
Winnipeg, Man.—A view of the Main street.

Station and garden, C. P. R., Mooscjaw, Sask.

Steam ploughing and harrowing at one time, Northwest

Montreal Harbour Commission—The testing of one "Simplex" moulded concrete pile.

Ottawa—An opening of Parliament.



Rideau Canal—Segmental face of the dam at Jones' Falls lock station. Length 360 feet, height 60 feet.

Ottawa—The pier at Britannia bay.

Ottawa—A view of the pavillion and promenade at Britannia bay.

OTTAWA
GOVERNMENT PRINTING BUREAU
1913

NORTH WEST TERRITORIES
HUDSON BAY
MANITOBA
ONTARIO
QUEBEC
LABRADOR
Victoria Island
Baffin Island
Melville Peninsula
Boothia Peninsula
Gulf of Boothia
M'Clintock Channel
Cumberland Sound
Frobisher Bay
Southampton I.
Hudson Strait
Ungava Bay
James Bay
Nottingham Island
Belcher Is.
Mansfield I.
Great Slave Lake
Great Bear Lake
Athabasca Lake
Lake Winnipeg
Lake of the Woods
Lake Superior
Lake Nipigon
Lake Nipissing
Lake St. Clair
Lake Erie
Lake Ontario
Lake Huron
Lake Michigan
Lake Timiskaming
Lake St. John
Lake Mistassini
Lake Temiscamingue
Lake Abitibi
Lake Manitou
Lake Simcoe
Lake Scugog
Lake Rice
Lake Chemong
Lake Couchiching
Lake Muskoka
Lake Joseph
Lake Rosseau
Lake Kashagawigamog
Lake Wilcox
Lake Ontario
Lake Erie
Lake Huron
Lake Michigan
Lake Superior
Lake Nipigon
Lake Nipissing
Lake St. Clair
Lake Timiskaming
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Lake Simcoe
Lake Scugog
Lake Rice
Lake Chemong
Lake Couchiching
Lake Muskoka
Lake Joseph
Lake Rosseau
Lake Kashagawigamog
Lake Wilcox
ALBERTA COAL DISTRICT
Edmonton
Calgary
Banff
Canmore
Lethbridge
Bankhead
Medicine Hat
Saskatoon
Prince Albert
Battleford
Moose Jaw
Regina
Brandon
Portage la Prairie
Winnipeg
Selkirk
Port Arthur
Fort William
Kenora
Rat Portage
Sault Ste. Marie
Sudbury
Cobalt
Haileybury
North Bay
Parry Sound
Orillia
Barrie
Midland
Penetanguishene
Collingwood
Owen Sound
Goderich
Sarnia
Windsor
Chatham
Kingston
Belleville
Peterborough
Lindsay
Port Hope
Cobourg
Oshawa
Toronto
Hamilton
Brantford
Woodstock
Stratford
Berlin
Guelph
Galt
Preston
Ottawa
Pembroke
Arnprior
Renfrew
Carleton Place
Almonte
Perth
Smiths Falls
Brockville
Prescott
Cornwall
Hawkesbury
Montreal
Lachine
Valleyfield
Sherbrooke
Magog
Coaticook
Granby
St. Hyacinthe
Drummondville
Three Rivers
Shawinigan Falls
Joliette
Berthierville
Sorel
Quebec
Levis
Lauzon
Montmagny
Rimouski
Matane
Metapedia
Campbellton
Dalhousie
Bathurst
Chatham
Newcastle
Moncton
Sackville
Amherst
Truro
Pictou
New Glasgow
Stellarton
Halifax
Dartmouth
Windsor
Kentville
Yarmouth
Digby
Annapolis
Liverpool
Lunenburg
Bridgewater
Shelburne
Barrington
Sydney
North Sydney
Glace Bay
New Waterford
Louisburg
Port Hawkesbury
Antigonish
Canso
Arichat
Pictou
Charlottetown
Summerside
Tignish
Souris
Georgetown
Montague
Murray Harbour
Souris Coal Field
LAKE of the WOODS GOLD DISTRICT
ATIKOKAN IRON DIST.
MATAWIN IRON DIST.
HUNTER ISLAND IRON DIST.
THUNDER BAY SILVER DIST.
PORCUPINE GOLD DIST.
ONTARIO SALT DIST.
MICHIPICOTEN IRON DIST.
BLAKE GOLD DIST.
NEW ONTARIO GOLD DISTRICT
COBALT SILVER DISTRICT
COBALT
NORTH BAY
SUDBURY
HAILEYBURY
TIMISKAMING
ABITIBI
MANITOU
SIMCOE
SCUGOG
RICE
CHEMONG
COUCHICHING
MUSKOKA
JOSEPH
ROSSEAU
KASHAGAWIGAMOG
WILCOX
Counties north of this not virtually unprospected and south of it only partly prospected
Lethbridge CYPRESS HILLS and WOOD MOUNTAIN COAL DISTRICT
SEALS
WALRUS
WHITEFISH AND TROUT
RIGHT WHALES
ARCTIC SALMON
SEALS AND WHALES
COD
HERRING AND LOBSTERS
LOBSTERS
COD HERRING AND LOBSTERS
COD LOBSTERS OF ST. LAWRENCE GULF
COD HERRING AND MACKEREL
NEW BRUNSWICK
NOVA SCOTIA
PRINCE EDWARD ISLAND
ATLANTIC
OCEAN
NORTH DAKOTA
SOUTH DAKOTA
WISCONSIN
MICHIGAN
MINNESOTA
MONTANA
Legend
Main Lines
Grand Trunk Railway, and Gr. Tr. Pac. Constructed
Grand Trunk Pacific Railway, under construction
Grand Trunk Pacific Railway, located
Canadian Pacific Railway, in operation
Canadian Pacific Railway, under construction
Canadian Pacific Railway, located
Canadian Northern System, in operation
Canadian Northern System, under construction
Canadian Northern System, located
Intercolonial Railway
Great Northern Railway (U.S.)
Grand Trunk Pacific Railway
miles
Halifax to Moncton (I. C. R.) 186
Moncton to Quebec bridge (Nat. Trans.) 460
Quebec bridge to Winnipeg (Nat. Trans.) 1345
Winnipeg to Edmonton 793
*Edmonton to Prince Rupert 962
3746
*Under construction, March 1910 375 miles.
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